THE GAS JOURNAL

JULY 13, 1932

Vol. 199 84th Year No. 3608

A Glance at the Contents—

The "Journal" Index.

With this issue of the "JOURNAL" is included as a supplement the index for the past quarter, April to June.

Jenkins-Klönne Chamber Ovens.

On Tuesday of last week an installation of Jenkins-Klönne Chamber ovens was inaugurated at the Works of the Westgate and Birchington Gas Company—the first plant of this type to be erected in this country. [p. 87.]

Road-Making with Tar.

Forced by economic circumstances to seek new sources of revenue, the small gas-works at Gap, France, has undertaken the repair of roads in its neighbourhood, and the novel means employed for the purpose are referred to on p. 92.

Developing Coke Sales.

The Toulon Gas Company undertakes, for a certain sum, dependent on the size of the installation, to take charge of the central heating appliances of large buildings or blocks of flats. The service includes supply of the necessary coke, stoking of the boilers, and disposal of the ash. The system has given excellent results and the number of clients is rapidly increasing. [p. 92.]

New Showrooms at Wickford.

The Gas Light and Coke Company's latest showrooms—the 51st in the Company's area of supply—were formally opened in the Essex village of Wickford last week. [p. 93.]

Testing Benzoles for Sulphur Content.

Messrs. Claxton, Hancock, and Hoffert, Research Chemists to the National Benzole Company, Ltd., describe a new volumetric lamp for the determination of the total sulphur content of benzoles, and give an account of their experiences of the present standard method devised by the late Dr. W. B. Davidson. [p. 94.]

Detection of Gas Leaks.

Reference is made to the "Vulkan" gas leak detector. The instrument is very sensitive; hence the boreholes need be of but small depth and diameter, and are made with little effort, for example, between two paving stones. The Gluckauf detector, for use in premises, is also described. This instrument requires merely to be moved along the gas pipes or across the taps, when the smallest leak is made evident by the lighting of a lamp. [p. 92.]

Finance Act, 1932.

A stamped and addressed envelope enclosed with a request to the "GAS JOURNAL" Offices, 11, Bolt Court, Fleet Street, E.C. 4, will secure for owners of Seymour's "Assessment of Gas Undertakings" an Addendum slip of Notes on the relevant sections of the 1932 Finance Act.

Forthcoming Engagements

July 20.—B.C.G.A.—Meeting of Executive Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.
July 21.—S.B.G.I. Council Meeting.
July 22.—GAS COMPANIES' PROTECTION ASSOCIATION.—Committee Meeting at 5, Victoria Street, S.W. 1.
July 26.—INSTITUTION OF GAS ENGINEERS.—Meeting of General Research Committee, 2.30 p.m.; 28, Grosvenor Gardens, S.W. 1.
July 27.—INSTITUTION OF GAS ENGINEERS.—Meeting of Joint Lighting Committee, 11 a.m.; 28, Grosvenor Gardens, S.W. 1.
July 27.—SOUTHERN ASSOCIATION (EASTERN DISTRICT).—Meeting at No. 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.
Aug. 16 and 17.—IRISH ASSOCIATION.—Meeting in Dublin.
Sept. 1.—ASSOCIATION OF STATUTORY METER INSPECTORS.—Annual Meeting in Edinburgh.
Sept. 8.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual Meeting in Ayr.
Sept. 22.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Meeting at Porthcawl.
Sept. 26 to 28.—B.C.G.A.—Annual Conference at Leeds.

1932 "JOURNAL" Directory.

Page 38.—KIRKHAM.—Mr. J. Crook, Engineer, Manager, and Secretary, has retired.
Page 82.—CRAIL.—Mr. A. Greig, deceased.

EDITORIAL NOTES

Lausanne

"THE writing that we have put upon the pages of history is not the end of an old chapter; it is the beginning of a new." These words were used by Mr. Ramsay MacDonald, when announcing last Saturday morning the conclusion of the labours of the six Power conference in the Agreement of Lausanne. Three weeks' hard work, with Mr. MacDonald as President, have had the successful result which all of us felt it must have, when failure involved a situation of incalculable gravity. On his return to London, the Prime Minister received a cordial welcome, and was heartily congratulated upon his great accomplishment. With first the War Loan Conversion Scheme, and now the Agreement of Lausanne, it cannot be doubted that two great steps have been taken towards a return to that confidence which is essential to an industrial revival. To the terms of the new agreement it is unnecessary to refer here; so far as we are concerned, the agreement is the thing.

Gas Technique in France

ELOQUENT testimony to a healthy, flourishing, and progressive condition of the French Gas Industry was furnished at the annual congress of the Union Syndicale de l'Industrie du Gaz en France, held in Paris last month; and to-day we conclude our review of the papers presented, the first part of which was published in the "JOURNAL" last week. Our review should prove of real service to our readers. Many of the papers are of considerable interest in view of the novelty of the subjects discussed; and in particular we call attention to four of these. In this country the regenerative system of firing continuous vertical retorts has not been employed. At Clichy, however, there are three installations of Woodall-Duckham vertical retorts, two of which are recuperative and one of which—the newest—is regenerative. This silica setting is heated by clean cooled producer gas, and is worked with a period of 25 minutes between reversals. It will be noted (p. 33 of last week's "JOURNAL") that the throughput is relatively high. The fuel consumption (9½ p.ct. of dry coke) is much less than that of the recuperative setting (15·1 p.ct. of dry coke), but, on the other hand, waste-heat boilers cannot be employed in conjunction with the former, owing to the very low temperature of the waste gases. These figures relate to the production of gas of a calorific value of 500 B.Th.U. per c.ft. The gas yield is approximately 3½ therms per ton more for the regenerative setting than for the recuperative setting. Further advantages of the regenerative setting are the greater ease of regulation, the greater uniformity of temperature, and steadier working. Nevertheless, each type of setting has its own special advantages.

On quite another subject—that of coke sales—a leaf might well be taken from the notebook of M. Séranne, who explains a method by which he is developing coke sales. The Toulon Gas Company undertakes, for a certain sum, dependent on the size of the installation, to take charge of the central heating appliances of large buildings or blocks of flats. The service includes supply of the necessary coke, stoking of the boilers, and disposal of the ash. Maintenance of a specified temperature is guaranteed. There is a stipulation to the effect that the installation must be capable of enabling this guarantee to be achieved, and that unnecessary waste of heat must be avoided. The service operates from Oct. 15 to April 15, the contract price being subject to a sliding-scale which comes into force according as the mean monthly average temperature is higher or lower than the mean of the monthly average temperatures recorded between 1924 and 1930 at the Toulon Observatory. The system has given excellent results and the number of clients is rapidly increasing. A lively spirit of enterprise is also being shown by the gas-works at Gap, which has actually undertaken the repair of roads in its neighbourhood. The means employed are certainly novel, and the result—a uniform road surface having excellent wearing properties—is a new source of revenue.

Finally, two gas leak detectors are described which are time-savers. For outdoor work, there is an instrument of such sensitiveness that the boreholes need be of but small depth and diameter, and are made with no great effort, for example, between two paving stones. A gang of four men, we are informed, were able to explore thoroughly a network 45 miles long in a period of four months, during which they were at work for 94 days; and a large number of small unsuspected leaks was discovered. The other instrument is for use inside premises, and gives a visual indication of minute leaks. It requires merely to be moved along the gas pipes or across the taps, when the smallest leak is made evident by the lighting of a lamp.

Jenkins-Klönne Intermittent Ovens

THE large party who were privileged to be present at the inauguration last week of the first installation of its particular type in this country found much to interest them in the new Jenkins-Klönne intermittent vertical chamber ovens at the works of the Westgate and Birchington Gas Company. By the introduction of the system into this country, the Chairman of the Gas Company, Mr. Henry Woodall, who it will be recalled erected the first waterless gasholder to be put up in Great Britain, has done further pioneer work. This holder was installed at Ipswich some six years ago, and since then the lead has been followed in many other places. Is history to repeat itself at Westgate-on-Sea? The speeches at the luncheon which followed the inauguration ceremony were optimistic on this point. Mr. Woodall himself expressed confidence that, though the installation is the first of its kind in England, it will not be the last; and Prof. John Goodman (Chairman of Messrs. W. J. Jenkins & Co., Ltd., who were responsible for the installation) declared that when his firm were quoting for this plant they indicated a very high result, but that so far as the tests had gone at present the figures placed before Mr. Woodall had been beaten in very case. Full details of the plant—which is working entirely on Kent coal, hauled by motor lorry from the Chislet Colliery to the works—will be gathered from the illustrated description appearing in later pages of this issue.

The designer of the plant, Dr. H. C. Max Klönne, bears a name which is already well known in the Gas Industry, for half-a-century ago his father, Herr Aug. Klönne, of Dortmund, was the patentee of regenerative retort settings, and his work in this connection, as well as his advertisements in the "JOURNAL," will be remembered by our older readers.

Bath Gas Order

A GOOD deal of space in several issues of the "JOURNAL" has been devoted to the proceedings on the Bath Special Gas Order, and these issues extend over a considerable period. The objects of the Order are to provide for the transfer to the Bath Gas Company,

by agreement, of the undertakings of the Chippenham Gas Company and the Corsham Gas Company, Ltd., and for an extension of the Bath Company's area of supply to include a number of parishes that are not at present within the area of any gas undertaking. The Order was deposited in the early part of 1930, but, owing to a combination of circumstances, it was not until December, 1931, that the Board of Trade inquiry—at which there was no opposition—was held. Then an interesting discussion ensued; the main arguments concerning a proposal to apply the basic price plan, with different basic prices in different parts of the area.

On the question as to whether the principle of multiple basic prices should be applied in the Bath area, Counsel for the Bath Gas Company said that if one charge were to be made throughout the whole area an average would have to be arrived at. One price throughout the whole of the area of supply would not be reasonable, because of the disparity between the costs of supplying the different parts of the area, owing to the nature of those various parts. In his view that circumstance, which justified the differential prices, justified multiple basic prices. He emphasized strongly that if the Board of Trade took the view that multiple basic prices were not to be allowed, the result must be to retard further amalgamations of this kind—though he did not say they would stop. If there were to be a single basic price covering the whole area of the amalgamated Company, then the Company would be deprived of any benefit resulting from the energy displayed in the development of the outer areas. Evidence on behalf of the agreement was given by Mr. George Evetts and Mr. Arthur Valon.

Multiple Basic Prices

THE Board of Trade, however, decided on principle not to agree to multiple basic prices—holding that there should be one basic price for the whole of the area covered by the Draft Order, with differential prices as between the Bath inner area and the areas outside. A further inquiry was consequently held in May, to decide what the basic price for the whole area should be; and subsequent to this the Board of Trade issued their proposed Order, in which the single basic price was fixed at 6·2d. per therm. The third hearing was when the Order came before a House of Lords Committee, as reported in this and last week's issues of the "JOURNAL." Counsel for the Company then explained that actually the question of whether the principle of multiple or single basic prices should be included in the Order was one between the Board of Trade and the Bath Corporation. The Company and the Corporation were still both willing to give effect to the agreement entered into between them for multiple basic prices.

It was admitted on behalf of the Board of Trade that there were a number of cases in which multiple basic prices had been sanctioned, but Counsel argued that when the system of basic prices was first adopted nobody could foresee what was going to happen. Now, however, he went on to say, there was a tendency to apply the basic price principle throughout the country, and in the course of the next few years one would very likely find the vast bulk of gas supplied on that basis. If that were so, then it was important that this question should be settled once for all. The Board of Trade had adopted a perfectly definite line of policy—viz., that the principle of multiple basic prices was a wrong one and would produce mischievous results in the future.

In the event the Committee decided that the Order should proceed, but with modifications to carry out the agreement arrived at between the Company and the Corporation. The discussion has been full, and a number of interesting points have been raised. The main question involved was, as pointed out, one of principle, and had nothing in it reflecting upon the administration or operations of the Bath Gas Company. Quite the contrary. The excellent service of the Company received due acknowledgment, and some outstanding figures in this connection were quoted. Mr. Evetts said he had taken from "Field's Analysis" figures relating to the three London Companies and the Provincial Companies which could be compared with Bath, and on all vital matters the Bath Company was equal or superior to the others. He believed the Bath figure representing the capital expended per million c.ft. of gas sold was the lowest given in "Field's Analysis." Elsewhere in his evidence he quoted the figure at £250. Mr. Arthur Valon, too, for the Bath Corporation, gave the Company full credit for being well managed, and said they had undoubtedly done their duty very fully with regard to reducing the price of gas. Further than this, Mr. Wrottesley, K.C., Counsel for the Board of Trade, gave his testimony, which was to the effect that "the Bath Gas Company was an exceedingly well-managed Company, and the achievement of selling gas at 5½d. per therm was a remarkable one." On all of which Mr. J. Wesley Whimster, the Engineer and Manager of the Bath Gas Company, deserves hearty congratulations.

Sulphur in Benzoles

DESCRIBED and illustrated on later pages of the "JOURNAL" to-day is a new apparatus for determining the sulphur content of benzoles. The authors of the article—Messrs. Claxton, Hancock, and Hoffert, of the National Benzole Company, Ltd.—are responsible for the new volumetric lamp, designed as a result of intimate and prolonged experience of the standard method of determining the total sulphur in benzoles and other light oil fractions from coal tar devised by the late Dr. W. B. Davidson ("JOURNAL" for Jan. 9, 1929) and adopted by the Standardization of Tar Products Test Committee. The authors call attention to certain causes of non-agreement between different laboratories using the standard test, and offer suggestions which are sure to be of great assistance when the revision of the standard method is under consideration. Discordant results, it would appear, are due both to the difficulty of preventing losses of carbon disulphide and to differences of opinion as to the necessity of correcting the results obtained for the sulphur contained in the alcohol. No mention is made of a blank test on the alcohol in the present standard method. In some laboratories this correction is presumably made, while in other laboratories it is assumed that the blank is negligible. In the authors' opinion, it is important that a correction should always be made for the sulphur contained in the alcohol, and sufficient alcohol should be burnt to determine this correction fairly accurately. When this correction is made, the results of tests tend to become low, but this is fairly general with practically all lamp methods, and is usually attributed to incompleteness of combustion.

For the new volumetric lamp, manipulation of which is rather more difficult than the standard method, the following advantages are claimed: Any quantity of the benzole-alcohol solution up to 50 ml. can be burnt without re-filling the lamp, and hence greater accuracy is secured for samples of low sulphur content. The lamp can be stopped at will and the results calculated from the quantity of the benzole-alcohol solution burnt. (With the standard lamp, the last 1 or 2 ml. of the benzole-alcohol solution takes an abnormally long time to burn.) Errors due to the solution in the lamp evaporating during the test and escaping combustion are reduced—particularly important when dealing with samples containing very volatile sulphur compounds, such as carbon disulphide. The flame can be adjusted to the maximum size that gives smokeless combustion, and it remains constant throughout the determination. Hence the time taken to burn a given quantity of the benzole-alcohol solution is reduced. And, finally, the volumetric lamp can be used for a wider range of products, without altering the degree of dilution of the original sample, since the size of the flame is adjustable.

We have no doubt that our readers will be glad to have this valuable description of the new apparatus and to learn of the experiences of the authors on this phase of the testing of benzoles.

CORRESPONDENCE

British Oil and Coal Fuel

SIR,—For some years past work has been going on with a view to the development of a new form of fuel to consist of a mixture of powdered coal and oil suitable for use in place of oil or pulverized fuel and especially for marine purposes.

The technical problems involved have been considerable, but some of the results have been distinctly promising and the reports of the recent tests carried out by the Cunard Company appear to indicate that success is now in sight.

The commercial side of the problem is, however, not so easy, especially in the case of Trans-Atlantic vessels, as instead of pumping oil into the bunkers in America (enough for the double trip) the oil would have to be separately brought to this country, thereby involving a heavy cost for freight, landing, treatment, and re-pumping.

If, therefore, foreign fuel oil had first to be imported, the cost of freight and treatment would probably easily outweigh any saving that could be effected by the use of the new fuel, and in any case the 60 p.ct. of oil required would help neither the British coal industry nor the National balance-sheet.

If, however, the oil were produced at a British colliery alongside the washed and powdered coal, the mixture could be made on the spot and entirely from British materials. This would confer a great benefit upon the mining industry, also giving an added measure of national security and improving the country's finances.

Fortunately, this can be effected quite easily, as oil has been made from coal by the "Coalite" process on a commercial scale for several years past. It has a large sale, is a well-recognized and standard product, conforms with the Admiralty specification, and has passed Admiralty tests. In the Debate on the Naval Estimates last year the Civil Lord said (Hansard, Vol. 249, No. 76, p. 1311):

> It can be said with confidence that the chemical difficulty of producing from coal a fuel fit for use in His Majesty's ships is a thing of the past, and I hope that in the very near future it will be possible to obtain supplies of oil from our coal at a price which will give a tremendous fillip to the coal industry of this country. We must remember, too, that the whole industrial life of this nation depends upon supplies of these power-producing commodities.

One of the "Coalite" plants is situated at the Askern Colliery, near Doncaster, and the accompanying photograph shows a train of coal oil leaving the works for an Admiralty Depôt. Similar trains of oil are a common sight in the North to-day, and the coal oil distillery at Barugh has been in constant operation for the past three years. There appears to be a great and ever-expanding market for the smokeless fuel, and there is no reason why the production of the oil bye-products should not increase to such an extent as to render it a most valuable factor in connection with the supply of any new fuel consisting of oil and coal.

The ability to mix the oil and coal together at the source of production may be the saving factor for these new proposals, in which event the benefit to the colliery industry and the nation generally would be incalculable.

Yours, &c.,
W. A. BRISTOW,
Chairman.

Low Temperature Carbonisation Ltd.,
28, Grosvenor Gardens, S.W. 1,
July 9, 1932.

Mr. Clark Jackson's Institution Paper

SIR,—I am very loath to continue further correspondence in reply to Mr. Mogford's criticism of my paper given at the recent Institution Meeting.

The paper was distinctly headed "The Results of Constructive Policy as applied to a small Gas Undertaking," and was set out showing the various stages and results obtained consequent upon this definite policy being adopted by the Gas Department.

It is very apparent from the tone of Mr. Mogford's criticism that he is writing with a prejudiced mind, and his criticism is not likely, therefore, to be of a constructive character and thereby of some little benefit to the Industry generally.

Having regard to the trade depression which has existed in South Wales during these past few years, and from which the Neath District has not been entirely free, the results obtained, both before and after the absorption of the Briton Ferry Works into the Neath Undertaking, speak for themselves.

It was only because Mr. Canning (last year's President of the Institution) considered that the results obtained at Neath, due to the constructive policy being carried out by the Department, might be of interest and of some little assistance to a number of smaller undertakings represented in the Institution, that I was asked by him and, only after some little persuasion, agreed to put together the paper submitted.

There is only one point which was omitted from my paper—namely, that having regard to the capital cost involved in the reconstruction work necessary if the constructive policy was to be put into operation, the Gas Committee asked Mr. Doig Gibb to give them his opinion of the whole scheme; and it has always been a pleasure to me to know that Mr. Doig Gibb recommended the scheme to be adopted in its entirety.

I could, with very great ease, reply in detail to the various points raised in Mr. Mogford's last letter, but I consider that the major portion of these can only be of local interest, and in fact they have all been thrashed out by the Neath Gas Committee long ago.

Yours, &c.,
WM. C. JACKSON,
Engineer and Manager.

Neath Corporation Gas Department,
July 9, 1932.

PERSONAL

Mr. THOMAS ELLIOT RUTHERFORD, late Director of the Hawick Gas Company, left personal estate in Great Britain valued at £39,576.

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Mr. R. J. AUCKLAND, Secretary of the Cardiff Gas Light and Coke Company, has been elected President of the Cardiff Rotary Club.

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Mr. S. W. GYNGELL, who has been with the firm for the past thirty years, has now been appointed Co-Trustee to Messrs. Clarks Lead and Colour Works Company, Reading.

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Mr. CHARLES RETALLACK, late Managing Director of Messrs. John Harper & Co., Ltd., Albion Works, Willenhall, left gross estate of the value of £30,034, with net personalty £27,942.

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Mr. H. H. REDWOOD, Assistant at the Basingstoke Gas-Works, has been appointed to fill the position of Assistant Engineer and Secretary to the Newmarket Gas Company. Mr. Redwood took up his new duties on Monday last.

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The Leeds Corporation Gas Committee has appointed Mr. HARRY JOHNSTON, Technical Assistant to the Blackpool Corporation Gas Department, as Assistant Manager of the New Wortley Gas-Works at a salary of £320 per annum.

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We learn that Mr. DONALD MCEWEN, who was Assistant to the late Mr. R. H. Ginman, Engineer and Manager of the Gas Department of the Leek Urban District Council, has been temporarily appointed to fill the vacant position.

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Mr. J. O. PASK, Manager of Ross Gas-Works, who has retired after 35 years' service, has been presented by Mr. H. J. Blake, J.P., on behalf of the Directors and employees of the Ross Gas Company, Ltd., with an illuminated address and other gifts. Mr. Pask also received a wallet of Treasury notes from the Directors.

OBITUARY

SIR RICHARD THRELFALL.

The death has taken place of Sir Richard Threlfall, F.R.S., the distinguished Chemist and Engineer, Chairman of the Fuel Research Board.

Born at Hollowforth, near Preston, in 1861, states "The Times," Threlfall was educated at Clifton College and Caius College, Cambridge, of which he was elected an Hon. Fellow in 1904. He studied also at Strasburg University, and was Hon. D.Sc. of Victoria University and Hon. Associate of the Manchester College of Technology.

In 1886 he was appointed Professor of Physics in the University of Sydney, N.S.W., and in 1896 was Chairman of the N.S.W. Royal Commission which investigated the causes of the spontaneous combustion of coal in ships, particularly cargoes of coal in sailing ships. He became a member of the Board of Invention and Research in 1915, of the Advisory Council for Scientific and Industrial Research in 1916, of the Munitions Invention Board in 1916, of the Chemical Warfare Committee in 1917, and of the Food Preservation Board in 1918. When the Fuel Research Board was instituted in 1917 he was one of its original members, becoming Chairman on the retirement of Sir George Beilby in 1923.

Besides being a Director of the chemical manufacturing firm of Albright & Wilson, Oldbury, Threlfall published various papers on chemical and physical subjects. Among other work he carried out experiments, based on the transmission of pressure by graphite and the softer metals, on the properties of matter at pressures up to 100 tons per sq. in. and temperatures up to 2000° C. One conclusion at which he arrived was that there was no wholesale transformation of amorphous carbon or graphite into diamond under the conditions of temperature and pressure reached in his experiments. He was a Fellow of the Royal and the Chemical Societies, and was made K.B.E. in 1917 and G.B.E. in 1927.

THE NEWS OF THE WEEK

Society of British Gas Industries.—We have received from the Secretary of the Society a copy of the Rules and List of Members, as at June, 1932.

A Dividend of 5 P.Ct., free of income-tax, is recommended in the Annual Report of the Berwick and Tweedmouth Gaslight Company, Ltd. The net profit for the year was £1237.

In Response to a Request from the local Co-operative Society, the Johnstone Town Council have agreed to reduce the price of gas in the Howwood district by 0·4d. per therm, or 1·67d. per 1000 c.ft., as from the September survey.

Gas Production in Switzerland.—According to a report lately issued by the Union of Swiss Gas-Works, the output from the eighty gas-works in Switzerland during last year amounted to 8434 million c.ft., an increase of 43 million c.ft. over 1930.

The Soviet Government Authorities, it is reported, have recently decided on the establishment of large new gas and coke works in Leningrad. It is stated that the new works will have an annual productive capacity of 2110 million c.ft. of gas.

Public Lighting.—Capt. W. J. Liberty has contributed "Part IV.," some 16 pages, to the "Roads and Road Construction Year Book," just issued, on the "Public Lighting of Roads and Streets." He deals with the various phases of street lighting.

Aslib.—The Ninth Annual Conference of the Association of Special Libraries and Information Bureaux will be held at Somerville College, Oxford, from Sept. 23-26. Full particulars of the conference may be obtained from the General Secretary (Mr. S. S. Bullock), 16, Russell Square, London, W.C. 1.

The Price of Gas has been reduced from 5s. 5d. to 5s. per 1000 c.ft. by Muirkirk Gas Light Company, Ltd. The Selkirk Gas Company have reduced the price by 2½d., making it now 3s. 6½d. per 1000 c.ft. for ordinary consumers and 3s. 9d. for prepayment customers.

An Extensive Fire occurred on Friday last in a warehouse at the rear of the head offices in Farringdon Road, E.C., of Messrs. Falk, Stadelmann, & Co., Ltd. This has not, however, in any way affected the firm's usual service, for they have other warehouse accommodation and are able to give prompt attention to all orders.

The Staff of Neath Gas Department held their annual outing to the Wye Valley on Thursday, July 7, when fifty of the employees took part. A break was made at Brecon to visit the works where their former Superintendent Engineer, Mr. F. Dupont, is now the Manager. Messrs. T. Merchant (stores department) and Harold Phillips (office department) were the organizers.

Imperial Chemical Industries, Ltd., inform us that British sellers of sulphate of ammonia have now announced the price of £5 5s. per ton for neutral sulphate of ammonia, basis 20·6 p.ct. nitrogen, in 6-ton lots carriage paid to buyers' nearest station for delivery up to June 30, 1933, but reserve to themselves the right to raise or reduce this price at any time without notice.

Cheaper Gas for Dundee.—There is to be a cut of 2d. per 1000 c.ft. at Dundee, while a new progressive scale of charging is to be adopted. Last year the price per 1000 c.ft. was 3s. 4d. to ordinary consumers; but the top price is now to be 3s. 2d. and the lowest (according to the amount of gas used) as low as 2s. 2d. Last year the industrial rate was from 3s. 3d. to 2s. 11d.; this year it is to be from 2s. 9d. to 1s. 11d.

THE NEWS—continued.

International Congress on Commercial Education.

The Clothworkers' Company have voted 100 guineas and the Leathersellers' Company 50 guineas towards the expenses of the International Congress on Commercial Education, which will be opened by the Lord Mayor in the Grocers' Hall on Monday, July 25.

The delegates are being entertained by the Government at a reception at Lancaster House that evening, while on the following evening, Tuesday, July 26, a reception is being given to them by the Lord Mayor and Corporation in the Guildhall.

The closing session of the Congress (of which Sir David Milne-Watson is President and Sir Francis Goodenough Organizing Chairman) will also be held in the Grocers' Hall; and H.R.H. The Prince of Wales has promised to attend and address the Congress on that occasion.

Nearly 500 delegates, representing 35 countries, have registered for attendance at the Congress, which promises to be an outstanding success.

South Metropolitan Company's Gala at South Shields.

The Annual Gala which is held at South Shields by the South Metropolitan Gas Company, who entertain the wives and families of their many employees on Tyneside, was held at the South Shields Y.M.C.A. playing field, and attracted over 600 guests.

Tea was provided in two large marquees. Major F. J. Bywater, Head of the Coal and Shipping Department, presided and was supported by Mr. C. Charlewood, London, Mr. A. Piette, Mr. W. S. Theobald, and Mr. A. H. Sparks. The band of the Tyne Division R.N.V.R. played selections of music.

Sports were held for adults and children, and the tug-of-war challenge cup was won by the crew of the steamer "Camberwell," who defeated the crew of the "Catford," the previous holders. The prizes were presented by Mrs. C. W. Stevens, wife of the Senior Captain of the Company's fleet, who was thanked on the motion of Commander T. C. Anderson, supported by Major Bywater.

Mr. G. A. Bell was Secretary of the Sports Committee and Mr. T. A. Baker, Treasurer.

Institution of Gas Engineers.

Copies of the following papers presented at the 25th Annual Convention of the Canadian Gas Association in Winnipeg on June 9 and 10, 1932, may be inspected in the Library of the Institution of Gas Engineers, 28, Grosvenor Gardens, London, S.W. 1:—

"Methane Gas from Sewage Sludge," by R. O. Wynne-Roberts (Consulting Engineer, Toronto).

"The Unity of Utilization and Rate-Making," by F. W. Satchwill (Gas Sales Manager, Winnipeg Electric Company).

"Belleville Gas-Works," by R. O. Wynne-Roberts (Consulting Engineer, Toronto).

"The History of Gas Manufacture in Winnipeg," by Henry Dunderdale (Superintendent of Gas Production, Winnipeg Electric Company).

"Oxwelding and Lindewelding on Recent Canadian Pipe Lines," by D. S. Lloyd (Service Engineer, Dominion Oxygen Company, Ltd., Toronto).

"A New Development in the Waterless Type of Gas Holder," by John L. Murray (Gas Engineer, Cumberland County Power and Light Company, Biddeford, Maine).

"The Production of Calcium Carbide and Acetylene at Shawinigan Chemicals, Ltd.," by A. E. Lawton and E. R. Williams (Carbide Division, Shawinigan Chemicals, Ltd., Shawinigan Falls).

"The Use of Gas for the Ignition of Oil and Coal Fuels," by Roy Soderlind (Combustion Engineer, Ottawa Gas Company).

"The Carbonization of Coal with Electricity," by H. S. Walker (Engineer, Research Department, Detroit Edison Company, Detroit).

"A Few Thoughts on Copper Service Pipes," by the Research and Engineering Dept., Mueller, Ltd., Sarnia.

"Gas Leaks and Supporting Gas Mains Over Cuts," by D. O. Wing (Assistant Superintendent, Mains and Service Department, Montreal Light, Heat and Power Corporation).

Association of Public Lighting Engineers.

The following is the provisional programme of the Ninth Annual Meeting and Conference, which is to be held in Blackpool from Sept. 5 to 8:

Monday, Sept. 5.

5. 0 p.m. Council Meeting at the Imperial Hotel.
7.30 p.m. Formal Opening of the Exhibition of Lamps and Lighting Appliances at the Imperial Hotel by the Mayor of Blackpool. Short Addresses, followed by light refreshments.

Tuesday, Sept. 6.

10. 0 a.m. Official Welcome and Opening of Conference at the Imperial Hotel.
Induction of new President.
Delivery of Presidential Address by Mr. Harold Davies.
Presentation of paper by Councillor R. H. Minshall on "The Administration of Public Lighting."

1. 0 p.m. Members will be entertained at luncheon at the Imperial Hotel by the Blackpool Corporation.

2 30 p.m An Address descriptive of the Exhibits will be delivered in the Conference Room. Members will subsequently proceed to the Exhibition, in the basement of the Hotel, which will be available for inspection throughout the afternoon. Printed particulars of Exhibits will be available.

Wednesday, Sept. 7.

10. 0 a.m. Annual Meeting and transaction of formal business.
A paper, entitled "The Planning of Gas Installations to conform with the British Standard Specification for Street Lighting," will be read by Mr. F. C. Smith (Gas Light and Coke Company).
A paper on similar lines dealing with Electric Lighting is in the course of preparation.

1. 0 p.m. The Association luncheon will take place at the Imperial Hotel.

2.30 p.m. A series of papers dealing with the Lighting of Towns of Small and Medium Size will be presented by Mr. H. Collins (Colchester). Mr. I. H. Massey (Oldham), Mr. J. H. Clegg (Burnley). A contribution is also expected from Mr. J. P. Blackmore (Bombay Gas Company).
It is proposed that the Exhibition will be open to the public during Wednesday, Sept. 7.

Thursday, Sept. 8.

No Conference business will be arranged, so that members may have the opportunity of visiting various places of local interest.
The evenings will be free for members to make their own arrangements.

Members of the Association are now being asked to furnish information on developments in their respective areas.

Cheaper Gas for Newcastle-on-Tyne.

The announcement of a reduction in the price of gas by the Newcastle-upon-Tyne and Gateshead Gas Company will be welcome news to both householders and industrialists throughout the large Northern area served by the Company.

The Company have decided to reduce the flat rate charge for gas by 0·2d. per therm, or one penny per 1000 c.ft. They are also making an alteration in the scale of the two-part tariff in favour of consumers.

The following table gives details of the revised charges, which apply from the meter readings last month and which are estimated to effect a total saving to consumers of about £25,000 per annum:

FLAT RATE CHARGES SUBJECT TO:

Discount (for early payment) off amount for gas only.

Consumption per quarter and *pro rata* for other periods—	
Up to 2000 therms	10 p.ct.
If over 2000 therms, but under 50,000 therms	15 ,,
If exceeding 50,000 therms	20 ,,
By gas engines with separate meters	20 ,,

TWO-PART TARIFF.

A fixed charge of 10s. net per quarter for each service pipe on consumers' premises and the following scale of charges for gas:

Where total consumption is in more than six separate premises

Consumption per quarter and *pro rata* for other periods.	Current flat rate gross price for district *less* the following rebates and 10 p.ct. discount for early payment.
For first 20,000 therms	1½d. per therm
For next 30,000 ,,	1¾d. ,,
For all in excess	2d. ,,

Where total consumption is in not more than six separate premises:

Consumption per quarter and *pro rata* for other periods.	
For first 20,000 therms	1½d. per therm
For next 30,000 ,,	1¾d. ,,
,, ,, 20,000 ,,	2d. ,,
,, ,, 10,000 ,,	3d. ,,
,, ,, 20,000 ,,	3½d. ,,
For all in excess	4d. ,,

SPECIAL CONTRACTS.

Special prices are quoted for contracted minimum quantities of 100,000 therms per annum consumed in special furnaces scheduled in the contracts.

Consumers who wish to take advantage of the two-part tariff and special contract charges have to sign special forms of contract.

Joseph Priestley, F.R.S.

The July-September Calendar of Messrs. W. C. Holmes & Co., Ltd., is a pencil portrait of that pioneer in English chemistry, Joseph Priestley, who was born in the West Riding of Yorkshire in 1733.

At first his studies were theological; later he took up the teaching profession and also studied the properties of air. These studies gained for him in 1766 a Fellowship of the Royal Society. He then became librarian and literary mentor to the first Marquess of Lansdowne. His meeting with Lavoisier in Paris was fruitful, and led to his demonstration of the production of oxygen ("dephlogisticated air"). Settling down in Birmingham he found congenial co-workers in Matthew Boulton, James Keir, James Watt, and Grasmere Darwin.

In 1791 he was associated with a dinner to celebrate the fall of the Bastille. The mob destroyed his chapel, his house, and the labour of years of study. He was shunned by scientists for his advanced opinions, and exiled himself in Pennysylvania, where he died in 1804.

His enduring monument is his work in chemistry, especially the chemistry of gases.

An Attractive "Summer Number."

The summer number of "Decoration" covers an unusually wide field of subjects, both practical and artistic. Its contents include such contrasts as "Improvements you can make in your Home" to the "Right Framing of Pictures;" or a "Talk with Eric Mendelsohn" to "The Joys of a Roof Garden."

Garden lovers will find a new and fascinating suggestion in an article on "Some Rock and Water Gardens." Those who are considering a new home will find helpful an article on "The House on an Awkward Site." Those, on the other hand, who, in these difficult days are moving to a house already in existence, will discover some really important hints in "How to inspect a House."

"Decoration" is only a quarterly magazine, but we look forward to its appearance for its unusual illustrations and its individuality. It is "different" and very pleasing to look through, in its colour pages, its photogravure, and its letterpress section.

A Word for Gas.

In an article entitled "The Ice Age and Economy" we obtain a glimpse of the gas-operated refrigerator in some of the excellent photographs of model labour-saving kitchens; while one illustration in particular—showing a setting of a gas cooker and coke boiler, complete with gas poker, in a tiled recess, together with a "Freezolux Minor" gas-operated refrigerator alongside—indicates that the value of gas in the modern labour-saving home is being fully recognized.

The notes on "How to Inspect a House" contain an illustration of a very attractive setting, some 2 ft. above floor level, for an inset gas fire in polished metal finish, showing how this arrangement not only saves space but is also at a height to give maximum warmth.

Perhaps because of the greater care necessary for most people in these days, in either planning a new home or remoulding the existing one nearer to the heart's desire, such a magazine as "Decoration" is becoming increasingly appreciated. The Publishers are Messrs. A. G. Reynolds & Co., Ltd., 34, Duke Street, St. James's, S.W. 1.

Training for Business Careers.

The completion of the first teaching year at the Department of Business Administration, London School of Economics and Political Science (University of London), brings to its close the initial stage of an experiment in training for business management fraught with great potential importance for the future of British industry and trade. Established in 1930 at the London School of Economics through the joint efforts of leading business firms and the School authorities, and financed mainly by business subscribers, the Department of Business Administration provides selected students with full-time training in the broad principles of business administration and, where necessary, gives as well a preliminary training of a general economic character.

In the year just closed twelve students attended the full-time business course, while a further thirteen started the preliminary economics course. Five students were nominated by their firms for full-time study, and a further five were nominated for evening study. Such nominations can only be made by firms subscribing £50 a year or more to the funds of the Department. The remaining students comprised men fresh from the university, a chartered accountant, an ex-army officer of high rank, and several men with business experience and a good general education. One student was a woman.

Since the students on the average were 24 years old, their training will stand them in good stead as in the future they advance to responsible posts. Their employers should benefit similarly. Training is restricted to students possessing high educational qualifications. In the full day-time course the specialized business subjects comprise marketing, production, and business finance, and deal with statistics and accounting and the principles of personnel management from the point of view of executive control.

In marketing and distribution, especially important to business at the present time, the Department has broken fresh ground by direct investigations of current practice. The subjects studied include, for example, buying habits and buying motives of consumers, operating problems of retail and wholesale firms, methods of sales promotion and price policy.

In teaching marketing the Department has used the Case Method, a novel and valuable feature of its work. The Case Method presents students with problems freshly drawn from business experience for study and discussion, and thus trains them to analyze many different business situations and find the fundamental principles on which action must be based. The method thus teaches by means of organized common-sense applied to the practice and problems of contemporary business.

Another novel feature of the course was a series of discussions opened by leading business men who gave students the benefit of their own wide experience and first-hand knowledge. Visits to factories, shops, and offices gave similar first-hand contact with business realities.

Much interest in business circles has been aroused by the work of the Department, and this year, for example, it has received inquiries from a number of firms seeking recruits trained in the principles of business administration. Experience shows that the present course, though necessarily experimental in character, has been framed on sound lines. Next year two new courses on Sales Management and Retail Store Management will be added.

Applications are now being received for admission to the next course, which starts in the autumn, and further information, together with application forms, may be obtained from Mr. Jules Menken, the Head of the Department, 11, Clement's Inn Passage, W.C. 2.

Lives or Lights.

"The remarkably low number of accidents occurring in the roads of South London and Kent, in spite of the heavy traffic they carry, is a tribute to the safety methods adopted by the authorities in these areas," said Mr. H. T. Chapman, M.Inst.C.E., the Kent County Surveyor, speaking recently at Maidstone, "Kent has for long been noted for its extensive use of safety-first road signs, such as clear directional indicators and red danger reflectors on telegraph poles, and for wide non-skid roads, as well as for efficient lighting."

"Lives or Lights" has been the motto of the authorities both in South London and in Kent, where all the principal centres are lighted by gas, and local authorities in these districts have expressed great satisfaction at the fact that the number of fatal accidents in towns in these areas did not, in any instance, reach double figures for the period covered by the report.

The areas covered by the districts referred to are served mainly by the South Metropolitan Gas Company and the South Suburban Gas Company.

"The Therm."

Congratulations must be extended to the Hastings and St. Leonards Gas Company upon the publication of the first number of their new monthly Co-Partnership Magazine, which bears the novel, but not inappropriate, title of "The Therm."

"Number One! A definite sense of achievement should accompany the reading, as well as the writing, of those two words in connection with the first issue of the Company's Co-Partnership Magazine. Young as the Co-Partnership movement is [we quote from the opening words of this new venture] there are already a number of publications appearing in connection with individual co-partnership schemes, and it is with a certain hesitant pride that Hastings joins those who have already taken this important step forward."

It is particularly fitting that this Magazine should make its bow during the year which marks the centenary of the Hastings Company, because it may be included as one of the celebrations, and one which illustrates the birth and

THE NEWS—continued.

growth of a new spirit in industry, so different from that which animated industry a hundred years ago.

The Magazine is a bright little publication, with an attractive cover design, and packed with live and interesting matter. There is a description of the co-partners' Centenary Summer Outing to the Royal Tournament at Olympia; a group photograph of the Co-Partnership and Social Club Committees; reference to the Institution of Gas Engineers' recent visit to Hastings; together with those personal columns which so greatly add to the value of a publication of this nature. We wish "The Therm" all success and a long and useful life in its endeavour to engender that true spirit of co-partnership which is so essential to the well-being not only of our own Industry but of every industry in the country to-day.

Bust of the late C. C. Walker Unveiled.

On Friday, June 24, a large company assembled in the Lecture Hall of the Walker Technical College, Oakengates, on the occasion of the unveiling of a memorial to the late Mr. Charles Clement Walker, from whose estate the building of the college was largely made possible.

The memorial, which has been presented through the generosity of Mr. R. J. Milbourne, Chairman of the Governors, takes the form of a marble bust of Mr. Walker, and is mounted on an oak pedestal.

A brass plate bears the following inscription: "Charles Clement Walker, Born 1822, Died 1897. Pioneer of Technical Education in this district, through whose benefactions the provision of this school was made possible, and to whose memory it is dedicated. This bust was presented September, 1930, by Mr. R. J. Milbourne, J.P., first Chairman of Governors, Managing Director of C. & W. Walker, Ltd." The memorial occupies a commanding position in the entrance hall of the college.

Mr. Milbourne, who presided at the ceremony, remarked that it had been said that great men did not need memorials to remind future generations of them, but it was not unnatural that those who were associated with them should desire to pay homage to their memories, not only for the personal respect they had for them, but for the regard they had for their work.

In an interesting sketch of the life of Mr. Walker, Mr. Milbourne said that he was born in humble circumstances at Clerkenwell, London, in 1822, and served his apprenticeship in marine engineering. His father had a small workshop in Clerkenwell as a manufacturer of gas and water valves, and other appliances used in gas-works. Mr. C. C. Walker, along with his younger brother, William, took up the business, which prospered and extended under their care to such an extent that in 1856 the works were removed to Donnington. The building in which that start was made consisted of three small village blacksmiths' shops, covering a ground area of 100 square yards. Those shops were still in existence at Donnington.

Although the start was on a very small scale, the indomitable energy and business capacity of the two brothers soon made itself felt. They developed the manufacture of large gasholders and gas plant generally to such a great extent that the business of the firm grew very rapidly, and at the time of Mr. C. C. Walker's death it was one of the largest of its kind in the world, covering an area of 18 acres.

Mr. Walker was held in high esteem by his employees. He did much to advance technical education. In 1870 he established a reading room and library at Donnington, and in that building he organized science and art classes. He was ever ready with a helping hand for any good work in the district, and gave evidence of not having forgotten the scene of his early youth and labour by laying out and adorning at his own expense two open spaces in densely-populated Clerkenwell. By his liberality the Royal College of Surgeons was given a sum of money enabling it to offer a handsome prize every five years for the best paper on the causes and cure of cancer.

He was an ardent Shakespearean student, and in 1896 he showed his interest in the Elizabethan drama by erecting a handsome monument in the churchyard of St. Mary the Virgin, Aldermanbury, London, to John Hemings and Henry Condell, the publishers of Shakespeare's plays. He also studied astronomy, and fitted up an observatory in the grounds of his residence, where he spent many hours in research and study of the heavens. At the request of the third Duke of Sutherland he conducted extensive excavations at Lilleshall Abbey, and afterwards wrote and published an interesting history of that ancient building.

Although what was mortal of Charles Clement Walker had passed away from their midst, his thoughts, desires, inspiration, and ambitions still lived. The magnificent college had been erected in the district in which he gave of his best, and the bust which he asked Mr. T. Ward Green (Chairman of the Salop County Council) to unveil might be considered as a complementary part of that complete memorial to the life-work and generosity of Mr. Walker.

Bottled Gas.

Dr. C. M. Walter, Head of the Research Department of the Birmingham Gas Department, is responsible for an interesting development in the use of gaseous fuel which, it is thought, will appeal to the motoring public. Compressed gas (produced in Birmingham) is stored in cylinders, or "bottles." These are made of steel alloys of high tensile strength, being only 6 lbs. in weight—which are fitted with standard burners, and the gas can be used in quantities as required. Two pints of water in an ordinary kettle can be boiled in less than three minutes.

Dr. Walter has prepared hot meals in the open country, while picnicking, by means of these cylinders, and he states that small cylinders, which may be carried in the pocket, are also being made. He takes the view that bottled gas may be of considerable use, in connection with incubators, in districts where a gas supply is not available from the mains, and also for various domestic purposes. He points out that if there should become a demand for bottled gas, works will doubtless provide their own compressing stations.

New Bye-Product Coking Plant for Manvers Main Colliery.

Following the decision of the Directors of the Manvers Main Collieries, Ltd., of Wath-on-Dearne, South Yorkshire, to carry out a big scheme of reconstruction in connection with their coking and bye-product plant, an order has been placed with Messrs. Simon-Carves, Ltd., the well-known colliery engineers, of Cheadle Heath, near Manchester, for a battery of the latest type coke ovens, complete with the necessary machinery, an up-to-date bye-product plant, coal and coke handling equipment, and coke-screening plant. The new ovens will have a rated carbonizing capacity of 500 tons of dry coal per day.

There will be thirty Simon-Carves twin-flued silica regenerative coke ovens, complete with electrically operated coal charging car, ram and leveller, coke guide, hot coke car and locomotive. The ovens, which will be 13 ft. 3 in. high and 38 ft. 5 in. over sole, with a mean width of 17⅜ in., will be fitted with patent self-sealing doors.

The coal-handling plant will comprise electrically-operated wagon tipplers, coal conveyors, crushers, and a reinforced concrete service bunker having a capacity of 2000 tons of coal. The coke will be quenched in a remote-type concrete tower with breeze ponds and pump house, and will be handled from a coke wharf by a conveyor, which will deliver to the primary screens, where furnace coke will be screened out and loaded to wagons. A secondary conveyor and screen house, with storage bunkers, will be provided for domestic coke.

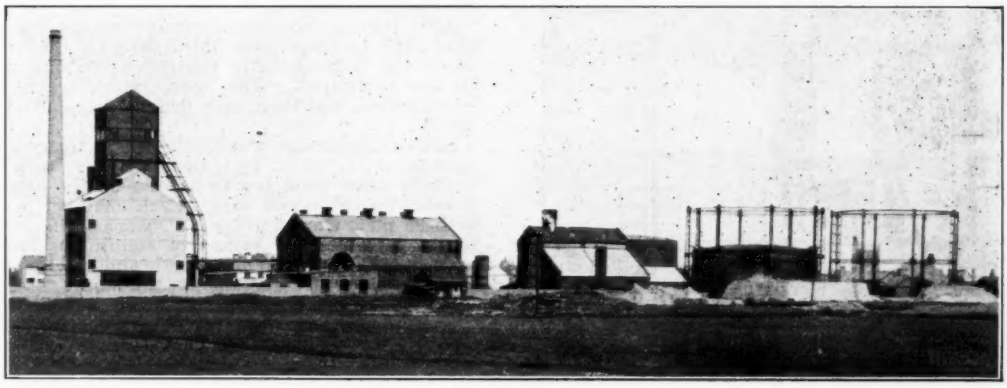
The bye-product installation will include gas condensers, ammonia and benzole scrubbers, with plant for the recovery and rectification of benzole, and a Simon-Carves electrostatic tar precipitator.

The Company anticipate that there will be an extension of the use of surplus gas for industrial and lighting purposes, which with their up-to-date plant they will be in a position to meet; the modern ovens will also enable them to supply high-grade coke for metallurgical purposes, as well as domestic coke of good quality.

JENKINS-KLÖNNE CHAMBER OVENS

Installation at the Works of the Westgate and Birchington Gas Company of the first plant of this type to be erected in this country

A large party assembled at the gas-works, Westgate-on-Sea, on Tuesday of last week, at the invitation of the Chairman and Directors of the Westgate and Birchington Gas and Water Companies, for the inauguration of an installation of Jenkins-Klönne intermittent vertical chamber ovens. The visitors were received by the Chairman (Mr. Henry Woodall), who was supported by his co-Directors (Messrs. Harold G. Palmer, A. W. Brookes, and Graham Wilkin), the Manager (Mr. Basil J. King), and the Secretary (Mr. W. H. Topley). A number of gas engineers were of the party, some of them having journeyed from London. Dr. Max Klönne was present, as were also Prof. John Goodman, Chairman, and Mr. John L. Butler, Managing Director, of Messrs. W. J. Jenkins & Co., Ltd.



GENERAL VIEW OF WORKS.

The Company was incorporated by Act of Parliament in 1881, and under the powers conferred by that Act acquired the original gas-works, which were then privately owned and situated in Birchington. The capacity of these works was, however, insufficient for the growing needs of the district, and in the following year Parliamentary Powers were obtained for the purchase of the present site and for the erection of new and larger gas-works thereon. Further Parliamentary Powers were obtained in 1913 by virtue of which the Company's area for the supply of gas was extended to its present limits, which embrace the Parishes of Westgate-on-Sea, Birchington, St. Nicholas-at-Wade, and Acol. The British Gas Light Company, Ltd., took over control of the Company in May, 1929.

Description of Works.

The works are situate at some distance from the sea-front and approximately midway between the two principal townships in the area of supply, and coal is brought by road from the Chislet Colliery, a distance of about eight miles.

The old carbonizing plant consists of 6 settings of 6 stop-ended retorts, 22 in. by 16 in. and 10 ft. long, operated by a West's manual charging machine, which was installed when the works were built in 1882. The machine was made at Maidstone at the original works of Messrs. West's Gas Improvement Company, Ltd., and is believed to be one of the few still in existence. When this plant is demolished, it is proposed to utilize part of the old retort house by dividing it into an engine-room, mess-room, and garage. The engine-room will contain new and enlarged exhausting plant and the existing boosters. There is also a Humphreys & Glasgow water gas plant having a capacity of 250,000 c.ft. per day.

The new carbonizing plant is an installation of Jenkins-Klönne intermittent vertical chamber ovens.

Gas is distributed by low-pressure system reinforced by high-pressure feeder mains. The compressors are of the Bryan-Donkin rotary type. The Company's mains were extended to St. Nicholas-at-Wade in February, 1931, and to Acol in October of the same year. These villages are supplied at high pressure, gas being distributed to the consumers through separate "Progas" governors.

Total length of mains is 26 miles, and the consumers number 2445. The make of gas is 91 million c.ft.

The new plant, which is the first installation of its particular type in this country, was manufactured and erected by Messrs. W. J. Jenkins & Co., Ltd., of Retford, to whom credit for introducing the Klönne chamber ovens must be given. It is, however, by no means an experiment, as similar plants have been in operation on the Continent since 1908. It was only after a thorough inspection of plants of this type on the Continent, that the order was placed with Messrs. Jenkins for a unit of a size suitable to the Westgate Works. Due consideration was given to the fact that Kent (Chislet through) gas coal was to be used.

The installation consists of one bench of ovens in three entirely independent settings; one of four chambers and two of two chambers each. Each setting has its own producer and recuperator. The plant has a guaranteed output of over 500,000 c.ft. of 500 B.Th.U. gas per 24 hours. It is housed in a steel-framed brick-filled building, and is complete with skip hoist for elevating the coal, coke, and breeze to the overhead storage bunkers (which latter are of sufficient capacity for 48 hours' supply when the whole of the chambers are in use), charging car, top gas offtakes, patented bottom offtakes, hydraulic, foul, and tar mains, waste-heat boiler, chimney, pumping plant, special coke discharge car, and coke screening plant.

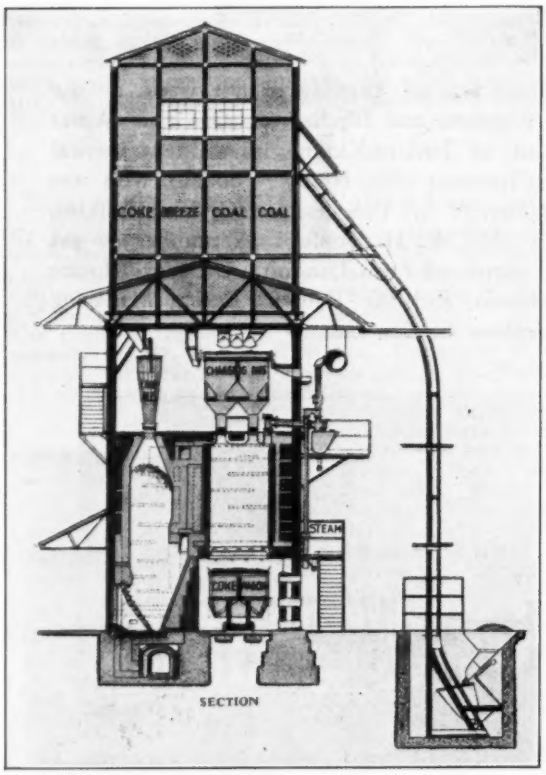
Handling Plant.

The skip hoist has a capacity of 10 tons per hour, and is driven from a steam engine controlled by automatic reversing gear, so that, once the engine has been started up, the skip continues to hoist and lower indefinitely without further attention.

Materials are delivered to the hoist by hand-propelled side tipping trucks. The receiving hopper, being fitted with a balanced chute, automatically fills the descending skip. Distribution of the materials to their respective

compartments in the bunkers is arranged for by means of special diverting chutes fitted with throw-over doors operated by hand winch at ground level.

A noteworthy feature of this hoist is that an indicator is provided in a convenient position which shows, without possibility of error, into which compartment the skip is delivering, thus obviating the necessity for repeated journeys by the operator to the bunker top. The discharge of the skip at the top of the lift is, of course, self-operative. The steam engine is housed in the building behind the hoist, in which building the waste-heat boiler is situated.



Typical Line Drawing of Jenkins-Klonne Intermittent Vertical Chamber Ovens.

Charging of the Chambers.

This is carried out at regular intervals, and flexibility of the plant is such that (dependent on the gas production requirements), the charging periods may be varied from 12 to 24 hours, alterations being effected at very short notice and without trouble. There is the hand-propelled charging car, fitted with ball-bearings, and suspended from rails carried from the bench steelwork. Thus the setting brickwork does not support any heavy outside loads. This car has compartments for coal and breeze, and is designed so that only the exact quantity of coal and breeze required for one chamber is filled into it. A noteworthy feature is the design of the filling levers, arranged so that it is impossible for the operator to charge the chamber with coal before having first released the preliminary pad of breeze necessary for the protection of the bottom door castings, at the same time bringing the coal up within the heating zone. Each chamber is provided with two charging ports, fitted with plug type covers, with machined and ground faces, to ensure gas tightness. The plugs are sunk into seating castings bedded into tongued and grooved fireclay blocks. A loose cover plate placed over the plugs gives a perfectly flat finish to the bench top, adding to the comfort of the operator, and giving a neat and tidy appearance to the whole bench.

Settings and Heating.

The chambers are heated by means of producer gas generated in furnaces of the Jenkins water-trough, step-grate type. Each step-grate is dished to form a trough of water, which is evenly distributed over the full width of each plate, thereby obviating any cracking or warping. A special feature of these furnaces is that all the grate fittings are loose and can therefore be removed and renewed with the minimum of trouble, and while the furnace is in operation. A further consideration is that repairs may be carried out to the furnace linings without completely letting down the ovens.

A condition imposed was that the new plant should be complete with its own steam-raising plant, not only for its own use, but sufficient to supply other works needs. A Spencer-Bonecourt waste-heat boiler, fitted with producer gas burner, is therefore incorporated, and for this reason the producers are larger than might have been expected, the front wall of the producer being tapped to provide further heat to the boiler. An interesting point in connection with the boiler is that the exhaust steam from the fan engine is utilized for steaming the chambers, the steam being first superheated.

Heating of the chambers is accomplished on the principle of delayed combustion by which the producer gas is admitted at one point only in the bottom heating flues, situated on each side of each chamber. The producer gas is here partially burnt by a portion only of an independently controlled stream of secondary air. The remainder of the secondary air necessary for complete combustion is admitted in stages from bottom to top of the oven heating flues. By this method of heating the chambers, the temperatures are perfectly balanced in a simple manner, and give a uniformity of heating throughout the full length and breadth of the chamber. The noteworthy feature of this system is the ease by which the upper flue temperatures may be increased without excessive bottom temperatures, whereby equal and uniform carbonization of the charge is ensured.

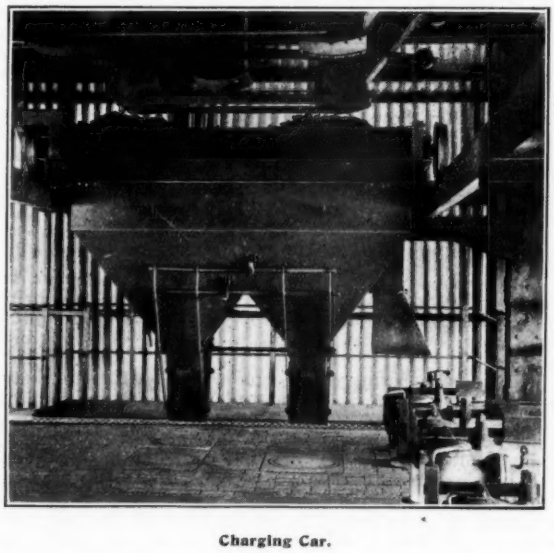
After leaving the upper heating flues the waste gases are conducted in large area flues through the recuperators, where the independently controlled streams of secondary air are preheated. The recuperators are of contra-flow construction, and built with firebrick tongued and grooved blocks.

Each chamber has a capacity of 2·33 tons of coal, and is approximately 15 ft. high by 9 ft. wide, with a perfectly uniform taper from top to bottom on the minor axis and parallel on the major axis. Each chamber is constructed with 95 p.ct. Oughtibridge S.P. silica walls and is bonded to its neighbour by means of continuous keyed headers which ensure maximum strength and rigidity throughout. The chambers are rectangular in plan. Massively insulated front walls ensure good heating and saving of fuel.

Special care has been taken to allow controlled expansion of the brickwork. This has come within the limits allowed for without any deformation of the bracings.

Patent Gas Offtakes.

It is now an established fact that the correct design of offtakes for intermittent vertical chamber ovens has a very important bearing not only on the results to be obtained, but on the life of the chambers and the ease of operation.



Charging Car.

The patented system of gas offtakes incorporated in this plant entirely eliminates pressure in the chamber, automatically and without the use of external seals. Each chamber is fitted with an offtake top and bottom, the two being coupled together above the hydraulic main—which also is independent to each chamber. After leaving the hydraulic main the gas passes directly to the large area foul main. All offtake pipes are adequately sprayed with

ammoniacal liquor from an overhead tank. A novel feature of these offtakes is the method by which the gas is taken from the bottom of the chamber. The offtake is actually formed in the dome of the chamber door, which is virtually a semi-circular pipe with a number of small openings spread over the full width of the chamber. This pipe is enlarged at one end to connect into the fixed pipe at the base of the chamber, whence it is coupled up to the foul gas main. These offtakes will work quite easily with the smallest screenings for the breeze charge, and are unchokable. Pitch in the bottom offtake is conspicuous by its absence.

Water Sealed Bottom Doors.

The bottom doors are water sealed to an extent of 4 in., this in itself being an additional safeguard against pressure in the chambers. Apart from this, it will readily be appreciated that disadvantages of metal-to-metal joints are obviated; furthermore, the seal is positive, and brings about cooler working conditions under the bench.

The chamber seating girders are of all-welded M.S. construction, with special cast-iron liners, forming the bottom steaming ports; under the girders a dipping plate is formed which projects into a lute formed in the door which, after the door is closed, is filled with water, completely sealing the chamber and preventing leakage.

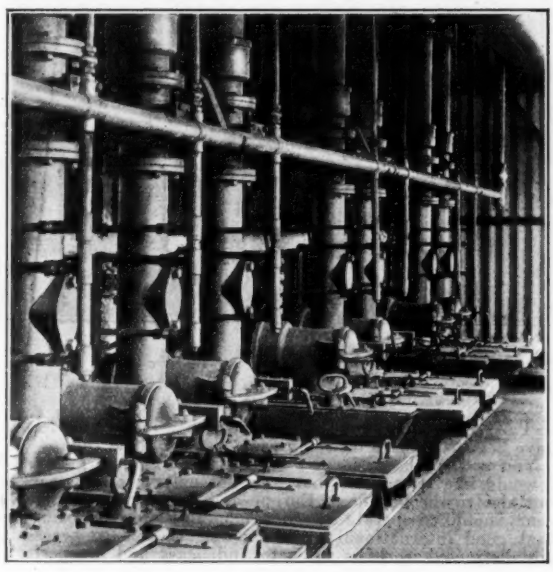
The doors are counterbalanced and are closed by hand gearing.

Not only is bottom steaming arranged for, but the recently introduced top steaming methods have been embodied, so that steaming operations may be carried out upwards or downwards at will. Full use is made of the bottom offtake, when steaming from the top, for as the blue gas formed is drawn off from the full area of the chamber it is conducted via the bottom gas offtake directly into the foul main for immediate admixture with the gas from a newly charged chamber.

An "Arca" regulator is fitted in the retort house to maintain stable conditions in the foul gas main. The chambers are maintained at practically level gauge throughout the full duration of the charge. Constant water pressure necessary for the efficient working of the "Arca" regulator is maintained by means of an overhead tank placed in the bunker tower, the overflow water from the regulator returning to a supply tank at floor level, to be pumped up again to the overhead tank for re-use.

Bench Bracings.

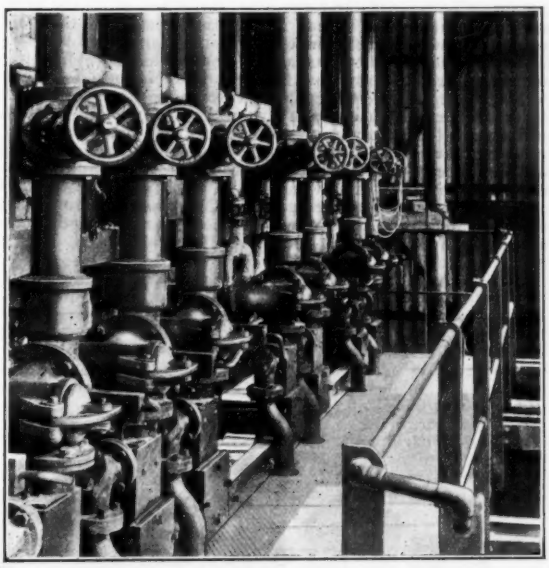
The settings are adequately braced by means of substantial buckstays, with strong secondary binders to the essential parts of the brickwork. The bench tie rods are



Arrangement of Top Gas Offtakes.

fitted with coil springs, to absorb expansion of the brickwork, and to prevent deformation of the buckstays. The tie rods are air-cooled by means of mild-steel tubes, forming around these tie rods an annular space, and through which a current of cool air is continuously passing.

All tar and liquor made gravitates to a cast-iron tank at ground level. This tank is fitted with division plates with weirs in order to effect separation of the tar and liquor. From the end compartment clean liquor is pumped to an overhead liquor storage tank placed in the bunker tower, and from this tank ammoniacal liquor under a constant head is taken to the sprays in all gas offtake pipes. The liquor is returned, along with the tar and liquor made to the separating tank below. Horizontal duplex pumps are provided and conveniently situated in the corner of the retort house at ground level.



Arrangement of Bottom Gas Offtakes.

Hot Coke Wagon.

Particular attention may be directed to this item, and the point to be emphasized is that the hot coke is spread over as large an area as possible with the minimum depth to give quick quenching, and also prevent overquenching of any portion. The wagon is placed directly under any particular chamber and immediately it receives the discharge it is propelled by hand-gearing along to the quenching tower, the latter being provided with sprays, and a wood-lined upper tower to take away the steam. The bottom of the wagon is lined with cast iron plates, the body is side-tipping, again operated by hand-gearing, and an ingenious arrangement of levers holds the front side of the skip well out of the way to give free discharge of the coke.

The coke screening plant is a self-contained unit situated adjacent to the quenching tower, with a hopper at ground level to receive the coke from the skid and direct it to a continuous bucket elevator, which feeds an adjustable coke cutter with renewable knives. A rotary screen finally grades the coke into the desired sizes.

All the motive power required is provided by Sissons high-speed steam engines.

Foundations were included in the main contract, and an interesting point is that no shoring was necessary when constructing the hoist pit, due to the chalk sub-soil.

Inauguration Ceremony.

When the party had assembled, Mr. Woodall put into operation the skip hoist. Coal was first taken up to the bunker, and while the skip was descending, the various flap doors in the top hopper were altered from the ground floor level, so that the skip would next deliver and discharge coke. A move was then made to a position near the quenching chamber, where the Chairman caused the chamber to be discharged, and the operations of quenching coke and discharging it from the coke bus were witnessed. Afterwards the party proceeded to the top of the bench, in order to see the charging of the chamber. The inspection completed, those present assembled in a marquee for luncheon, at the invitation of the Chairman and Directors of the Westgate and Birchington Gas and Water Companies.

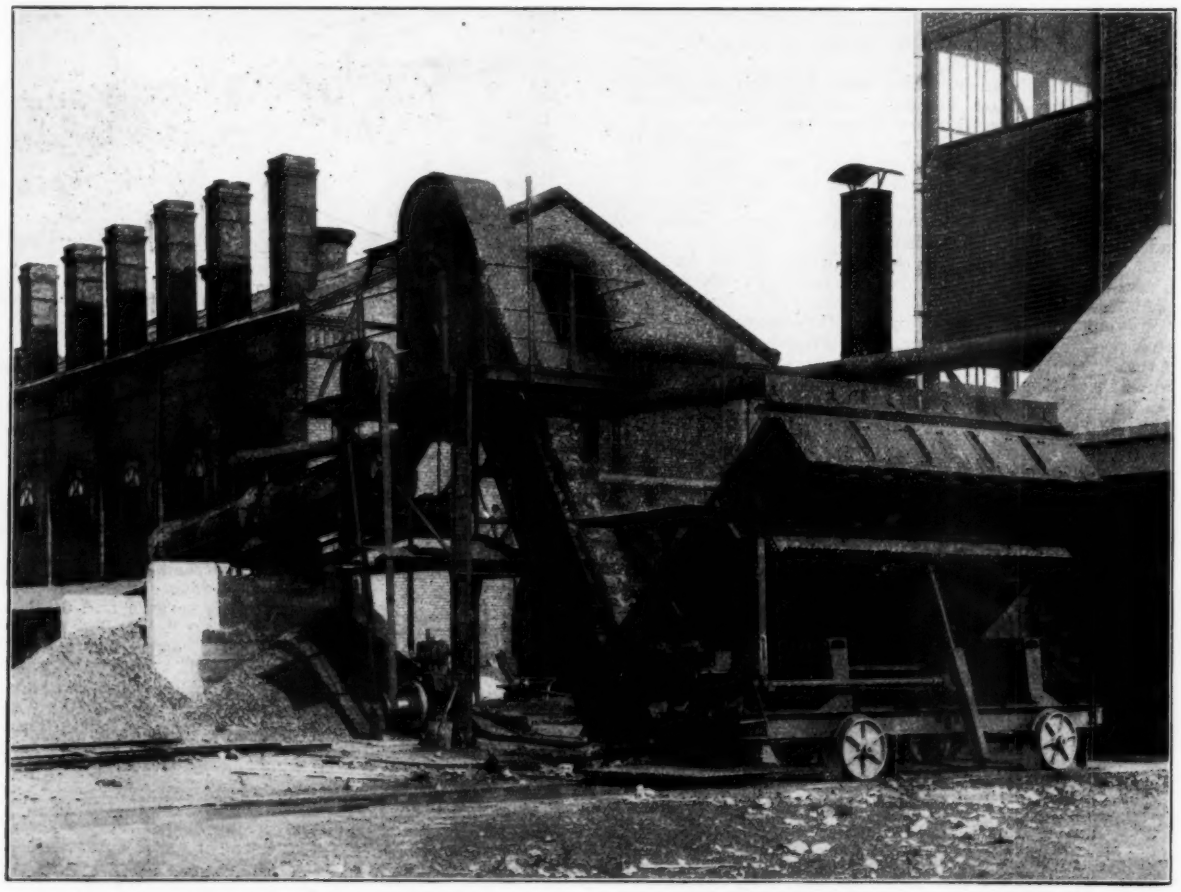
A Go-Ahead Company.

Councillor W. F. Longrigg, M.A., toasting the Companies, said that what they had seen that morning must have convinced them all that the gas undertaking was go-ahead and very much up to date. In installing this plant, the Gas Company had doubtless desired to benefit both the consumers and

themselves. They were also indebted to the Water Company for all they had done to make the water supply what it was to-day instead of what it used to be.

Wise Expenditure will Yield a Good Return.

Mr. Henry Woodall (who presided) said, in reply, that it was a great pleasure to his colleagues and himself to see so many of their friends there that day. The British Gas Light Company acquired the Westgate Gas and Water Undertaking in 1929, and had been very busy ever since then in making extensions to both works and district. Might he say to the gentlemen representing the Local Authorities, that the Companies had had to spend large sums on extensions, and until they were able to utilize the new gas and water works more fully, and had made proper provision for the depreciation of the now derelict plant, they could not hope to make any great reduction in the price of the commodities they supplied? He would just mention that they had been able to make two reductions in the water charges. When he told them that since 1929 there had been spent over £32,000 on the gas-works and district, and £10,500 on the water-works, they would be able to realize the difficulties as to reducing prices. It would, he was sure, be appreciated that the Companies had given a good deal of employment in the district, and that they had works, both gas and water, which were now of the most modern type, which would enable them in time to give, not only a good supply, but a cheap one. No one realized better than did his colleagues and himself that the greatest security they could have was to sell a good article at a reasonable price.



HOT COKE WAGON AND COKE SCREENING PLANT.

Gas Made Entirely from Kent Coal.

They would be interested to know that the gas was made entirely from Kent coal. It was a pleasure to have with them Mr. Forster Brown, Consulting Engineer to the Chislet Collieries, and to thank him for the interest he had shown in the Company's comparatively small contract, and for doing so much to clean and screen his coal to suit the purposes of their works. He trusted Mr. Forster Brown would not, when they were making new contracts, put a commercial value on these remarks! [Laughter.]

The New Plant the First of its Kind in this Country.

Continuing, Mr. Woodall said: And now, gentlemen, I want to welcome Dr. Klönne. We greatly appreciate his coming from Germany to be here to-day. Dr. Klönne's name is known to all gas men. It was his father who introduced regenerator retort settings, and Dr. Klönne's firm have always been pioneers. The intermittent vertical retort setting you have seen to-day is carried out from Dr. Klönne's designs, though all the material is of British manufacture. There are several systems of intermittent vertical retorts in this country, but they are all of German origin. The one we have adopted here is the first of its kind to be erected in this country, and from its performance I do not think it will be the last. Some six years ago I introduced the first waterless gasholder into this country. It was erected at Ipswich. This, again, was of German origin. A large number of these gasholders have since been erected in the British Isles, and have been found most useful and efficient. When I visited Germany to inspect the waterless gasholders, the Chairman of the Company manufacturing them said: "I hope, Mr. Woodall, that you will agree to the erection of one of these holders in England, when you remember the dozens of gasholders your firm have designed and had erected in my country."

Only a few weeks ago at Tottenham, our Engineer there, Mr. H. C. Smith, whom we are very pleased to have with us to-day, took me for a ride in a lorry running on compressed gas—the first, I believe, to be propelled by this means in England. The pioneers of the system are the French, and it was to Paris we went to get particulars, and to inspect lorries which have been run there on compressed gas for some time.

You will, perhaps, forgive my mentioning these matters, but I would like to suggest that it is not only to our own benefit, but also to the benefit of Europe and the world, that we engineers should co-operate together, helping thereby to bring about that good international understanding that is so necessary if our distracted world is again to find peace and prosperity.

Good Service and Good Workmanship.

After referring to some of the principal guests present, the Chairman remarked that he could not miss this opportunity of saying in public how well they were served by their officials, their staffs, and the workmen. Most of those present knew the Engineer, Mr. King, and appreciated, as did the Board, his energy, his ability, and above all his unfailing cheerfulness. He (Mr. Woodall) had said little with regard to the plant they had come to see, but they were not yet in a position to publish full statistics. He was, however, very pleased with its performance to date, and felt sure that it would amply justify its adoption. Their local friends and consumers would, he hoped, go

away to-day feeling that the Company were not unenterprising, and that they were doing all they possibly could to serve them well and efficiently.

Pioneer Work.

Mr. Harold G. Palmer (Deputy-Chairman of the Company) submitted the toast of "Our Guests," with which he coupled the names of Dr. Klönne and Mr. Hardie.

Dr. H. C. Max Klönne, in the course of his reply, thanked the Company for this opportunity of seeing the first of those carbonizing plants built in this country to his design. The Chairman had referred to the work of his Company, and what they had seen that day proved that the firm had not stood still, but had succeeded in evolving a plant that met present-day carbonizing needs. He desired also to express his thanks to Messrs. Jenkins & Co., Ltd., and to their Managing Director, Mr. Butler, for the way in which the work had been carried out. He had carefully inspected the whole plant, and was satisfied that the work had been done so well that his own firm could not have done it better. He sincerely hoped that the Gas Company would continue to obtain the fullest satisfaction from this plant, and that the results would be such as to convince gas engineers of this country that the adoption of such a plant presented a solution of their carbonizing difficulties. He was particularly gratified to be present that day, in such circumstances, because it indicated that there had been collaboration and interchange of ideas between one of the gas undertakings of this country and a German firm. He trusted that such interchange of ideas would develop.

Mr. Thomas Hardie (Chief Engineer of the Gas Light and Coke Company), who also replied, expressed his thanks for the opportunity of seeing this most interesting plant. In this case the Company had, as the Chairman himself had done in many other instances, taken the lead in putting forward a new system. Mr. Woodall had referred to the fact that he was the first to introduce the waterless holder into this country; and since then many holders of that character had been erected. Dr. Klönne himself was not altogether uninterested in that type of holder, and he would take a certain amount of interest in the fact that Mr. Woodall had introduced it into this country. The local consumers would benefit from the fact that the installation they had just inspected was the first of its particular kind. Gas engineers were always interested in new types of plant, and the district must gain from the visitors who would be drawn from all parts of the country to Westgate in order to inspect this intermittent chamber oven installation.

"The Contractors."

The Chairman said they could not conclude without congratulating the Contractors on the excellent work they had carried out. A number of the guests were distinguished gas engineers, and they would appreciate the good workmanship and the great care which had been exercised in the detail connected with the plant. Messrs. Jenkins were a firm of good repute, and he was sure that the job which they had done there would enhance their already high reputation. He had watched the work carefully, and had been impressed throughout by the way in which it had been done. The installation was a small one, but no effort had been spared to make it as perfect as possible. As he had already said, this was the first installation of its kind in England, but he did not think it would be the last. "'Tis not in mortals to command success," but he thought that Messrs. Jenkins had earned it. He asked them to drink to the success of the Contractors, and he coupled with the toast the name of Prof. John Goodman, the Chairman of the Company.

Prof. Goodman, returning thanks on behalf of the Contractors, said that Messrs. Jenkins & Co. regarded it as a great compliment that one of the first gas engineers in the country should have placed this order with them. They realized from the very first that a great deal depended on the plant. As a body gas engineers were perhaps inclined to be conservative, and there was always some difficulty in introducing new gas plants. Mr. Woodall leading the way, however, had cleared away practically the whole of their difficulties in this respect, and his firm confidently believed that in the near future plants of this type would be dotted all over the country. It was a great gratification to them to know that they had satisfied Mr. Woodall, and it was, if possible, even more gratifying to know that they had satisfied Dr. Klönne. To say that the first of these plants Messrs. Jenkins had erected could not have been better done by Dr. Klönne's own firm was the highest possible commendation. But they owed a great deal to Dr. Klönne, who had been the kindest possible friend to them, helping them in every way. In carrying out a job of this kind, the inspection work must be perfect, and for this the firm owed a great deal to their representative, Mr. Crowther. When they were quoting for this plant, they indicated a very high result, but so far as the tests had gone at present the figures placed before Mr. Woodall had been beaten in every case.

Mr. John L. Butler (Managing Director of Messrs. Jenkins & Co.) said that before they separated he wished, on behalf of his firm, to ask Mr. Henry Woodall to accept a small silver model of the plant that had been inspected that morning. He hoped, if Mr. Woodall would accept it, that it would serve to remind him of the fact that he had been a pioneer with regard to that type of plant in this country.

The Chairman, in acknowledgment, said the model had been very nicely made, and would be a pleasant memento of a happy occasion.

At the Inauguration of the Jenkins-Klönne Intermittent Vertical Chamber Ovens at the Westgate-on-Sea Gas-Works.

In the centre of the front row is Mr. Henry Woodall, Chairman of the Westgate and Birchington Gas Company, and on his left is Dr. Max Klönne, the designer of the plant.

summary, was compiled from replies to a questionnaire; and the value of the data is increased by a discussion of the factors which are concerned in the efficient working of purifiers and by a description of analytical methods of control. Among the subjects dealt with are the nature of the oxide used at different works, temperature and humidity conditions, oxygen content of the gas in relation to revivification, alkalinity, tar fog, gas velocity, concentration of sulphuretted hydrogen in the gas, methods of rotation, regeneration, charging of purifiers, reversal of flow, and steam injection.

Gas Washing.

The mathematical theory of gas washing for removal of ammonia, benzole and naphthalene was the subject of a paper by A. Bolzinger, who dealt with scrubbers of different types including direct current, counter current, and centrifugal scrubbers. Such factors as rate of flow of the scrubbing medium, contact time, and entrainment of liquid by the gas were considered.

Distribution.

B. Walckenaer discussed the merits of an all-steel distribution system with welded joints for the distribution of gas, the object being to provide a tight system having a long life.

Furnaces.

J. Brodin described, with details as to the working results, a surface combustion furnace of large size constructed for the reheating of 100-ton ingots.

Large-Scale Use of Producer Gas Made from Gas-Works Coke.

A further paper by J. Brodin dealt with a plant comprising a mechanical Heurtey producer handling 4-4½ cwt. of coke per hour and installed for the provision of a gas of low hydrogen content to be used for the melting of aluminium. This type of producer is normally surmounted by an atmospheric-pressure boiler which serves to humidify, to a controlled extent, the primary air, which is caused to pass over the surface of the water. In view, however, of the desire for a gas of low hydrogen content, the air was not humidified in this particular installation. Charging of the producer is effected by means of a Bentley and Appleby automatic distributor. The producer gas is freed from dust by the agency of water in a scrubber tower of the plate type. Tar fog is removed in a special type of centrifugal machine into the inlet of which water is injected. Final purification of the gas is effected in a coke filled tower, and the gas is then dried in one of two towers filled with layers of wood shavings and sawdust. After one of these has been in use for a time, the water absorbed by it is driven off in a current of waste gas and the other tower is put into service.

Two Tourbillon furnaces of the surface combustion type are employed for melting the aluminium, one of 3 tons, the other of 1 ton capacity.

Gas Light and Coke Company's : Service in Outlying Districts :

New Gas Showrooms — the 51st in the Company's area — opened in the Essex village of Wickford

Alongside the oldest cottage in the village of Wickford, Essex, the Gas Light and Coke Company have, by the erection of attractive new showrooms, entered upon the second fifty of their service centres throughout their area of supply, extending as it does from Southend to Windsor.

The Company are rapidly developing this Essex area, and it will be remembered that new premises were opened at Billericay—some five miles nearer the Metropolis—only last November. The residents of Wickford are fortunate in having up-to-date gas showrooms erected so promptly, for the supply of gas has only been extended to the district comparatively recently; so the public will now have the opportunity of inspecting a wide selection of gas and coke appliances.

The design of the building departs somewhat from that usually associated with Gas Light and Coke Company showroom premises now so familiar throughout their area; but this in no way detracts from its appearance. Rather it lends an air of dignity to the old-world village street, while at the same time harmonizing—as well as the modern can with the old—with the general " atmosphere " of the village. The building as a whole is a large three-storey one with an extensive frontage on the High Street; but the Gas Light and Coke Company are only occupying a third of the whole, the two other shop premises being let to local traders. Residential quarters are situated above. A set of high-power gas lamps set above the shop fronts brilliantly illuminates the frontage by night.

The interior of the showroom is furnished in the attractive style now generally adopted by the Company, and a very representative selection of appliances for all domestic requirements is to be seen. The apparatus is sectionalized, and much of it is connected up for demonstration purposes. A wide range of lighting fittings is displayed, and full emphasis is laid upon the value of the gas switch in this connection. Gas fires in various finishes and designs suit every style of furnishing; storage water heaters, circulators, and geysers show how gas can fulfil every water heating need; wash-coppers and irons lighten the labours of washing day, while the gas-operated refrigerator also is demonstrated to the residents of Wickford.

The Opening Ceremony.

The new premises were opened on July 6 by Mr. Daniel Cornish, Chairman of the Billericay Rural District Council, accompanied by Mrs. Cornish, who was presented with a bouquet by Miss Phyllis A. Low, daughter of one of the Company's co-partners, the latter receiving a gold and platinum brooch from Mrs. Cornish. Sir David Milne-Watson, LL.D., D.L., Governor of the Company, was present at the opening ceremony, supported by Mr. R. W. Foot (General Manager), Mr. W. L. Galbraith (Secretary), Mr. Thomas Hardie (Chief Engineer), Mr. Stephen Lacey (Controller of Gas Sales), Mr. A. P. Ryan (Publicity Manager), Mr. W. A. Waters (Local Manager), together with other senior officers of the Gas Sales Department which is responsible for giving good service to some 1,250,000 consumers in the Company's area of supply.

Sir David handed a silver key to Mr. Cornish, who, after opening the door, formally declared the premises open, at the same time saying that he hoped that they would be of benefit both to Wickford and the Company. Those present, who included Councillors and local residents, then entered the showroom and were welcomed by the Governor.

Meeting the Requirements of the Public.

Sir David Milne-Watson thanked Mr. Cornish on behalf of the Directors of the Gas Light and Coke Company for coming there that afternoon and doing them the honour of opening these new showrooms. This was the fifty-first showroom in the Company's area of supply, and they were therefore now beginning their " second jubilee." It might be asked, continued Sir David, why they had come to Wickford; but it was highly desirable that the residents should have all the blessings gas could confer upon them. They had large and well equipped showrooms in other parts of their district, and they could not expect consumers in Wickford to find their way to the centre of London to look at the apparatus there. Therefore the Company had a policy of, as far as possible, meeting the requirements of the various localities they supplied with gas. Sir David went on to refer to the extent and activities of the Company and its reasons for taking over these rural districts. This was on account of the general movement away from the Metropolis, thus making these districts the " dormitories " of London; they felt that it was well for the Company to follow the population, and they had continued this policy of stretching out along the north bank of the Thames. Until the Company took over the Grays area there was no gas in Wickford at all, and he congratulated them on now having a supply. It was the best servant they could possibly have and enabled a great deal of work to be done with a minimum of labour. Referring to the question of price, Sir David said that it was impossible to charge the same here as in the centre of London because the manufacture and laying of mains to

FRENCH GAS INDUSTRY

Eloquent Testimony to a healthy, flourishing, and progressive condition

The "JOURNAL" Review of the 55th Congress of the Union Syndicale de l'Industrie du Gaz en France

(*Concluded from p. 33.*)

SURFACE TREATMENT OF ROADS.

Forced by economic circumstances to seek new sources of revenue, the small gas-works at Gap has undertaken the repair of roads in its neighbourhood, and the novel means employed for the purpose were described by F. Descours. A road-train composed of an agricultural tractor, a tank lorry containing the tar and provided with spraying equipment, and a lorry charged with chippings is employed. The tractor has, in front, a mechanical sweeper for brushing the road surface, and the grouting lorry is carried on three wide cast-iron wheels; hence the road surface is successively brushed, sprayed, grouted, and consolidated during the travel of the train. The grouting lorry is, in addition, equipped with a bucket elevator driven by a petrol engine and supported on rails to enable it to be moved to either side or to the back of the lorry. The tar and chippings are discharged in the correct proportions and in suitable amount, and a uniform road surface having excellent wearing properties is obtained.

PREPARATION OF ROAD TAR BY THE "T.I.C." PROCESS.

A. Eichelbrenner described the "T.I.C." lead-bath tar distillation plant which is installed at Montbéliard. The blending process, of which a description has already been published in the "JOURNAL" (1930, 192, 161) is applied to the vertical retort tar produced at Montbéliard, and the resulting road tar is supplied to the École des Ponts et Chaussées.

The still, which is coke-fired and which, depending on the water content of the tar, consumes 4 to 6 p.ct. of coke or breeze on the weight of the tar, is worked alternately at a low and at a high temperature. The change-over is effected readily, without stopping the still, merely by increasing the temperature of the alloy. At the low temperature, the tar is distilled to a temperature of 200° C. and a quantity of the product is accumulated. The temperature is then raised and a further quantity of the tar is distilled to a temperature of 270° C., additional treatment with steam being given in a pitch-pot. The two products are mixed in the approximate proportions of 17 tons of the former to 7 tons of the latter, mixing being effected by a circulating pump or an agitator in tanks having a capacity of 25 tons.

The plant, which requires a visit, by way of supervision, only once every 30 or 40 minutes, is worked continuously, with a break of 24 hours each month to enable the fractionating column to be cleaned, and one of 72 hours every two months to enable the still to be cleaned.

Arrangements are installed which enable the road tar to be delivered at a temperature of 120° C. either in tar sprayers or in tank wagons. Tar can also be supplied to three storage tanks, each holding 200 tons of road tar. These have been laid down by the École des Ponts et Chaussées.

The results obtained indicate that it is profitable for a works with an annual tar make of 1000-1200 tons to prepare road tar and thereby to take advantage of the opportunity of supplying a central distributing station with road tar, rather than to send out crude tar for distillation elsewhere.

DETECTION OF GAS LEAKS.

J. Pinet emphasized the importance of the systematic control of their distribution system on the part of small undertakings, which, generally, have a great length of main in relation to the quantity of gas handled. Existing methods are cumbersome and a new instrument, the Vulkan detector, made by the Compagnie Continentale des Compteurs, was described. The apparatus depends on the difference in the rate of diffusion of gas and air through a permeable wall of large surface made from a special type of paper. The instrument is divided into two chambers by this wall, a manometer being connected to one of them. Air drawn from the bore-hole under examination is blown through the other chamber by means of a rubber aspirator, and, if but a small quantity of gas is present, an indication is obtained on the manometer. The instrument is very sensitive; hence the bore-holes need be of but small depth and diameter, and are made with no great effort, for example, between two paving stones. A gang of four men was able to explore thoroughly a network 45 miles long in a period of four months, during which they were at work for 94 days, and a large number of small unsuspected leaks was discovered. It is proposed to explore the whole network twice a year.

For the detection of even minute leaks in premises, the Gluckauf detector is employed. It, too, depends on diffusion. The increase in the pressure in a manometric chamber, when the instrument is exposed to a very low concentration of gas, moves a diaphragm which closes a circuit containing a small lamp and a dry cell. The instrument requires merely to be moved along the gas pipes or across the taps, when the smallest leak is made evident by the lighting of the lamp.

NEW METHODS OF DEVELOPING COKE SALES.

H. Séranne presented an account of the system adopted at Toulon to encourage coke consumption in view of the increased amount of coke available for sale due to increasing demands for gas.

The Gas Company undertakes, for a certain sum, dependent on the size of the installation, to take charge of the central heating appliances of large buildings or blocks of flats. The service includes supply of the necessary coke, stoking of the boilers, and disposal of the ash. Maintenance of a specified temperature is guaranteed. There is a stipulation to the effect that the installation must be capable of enabling this guarantee to be achieved, and that unnecessary waste of heat must be avoided. The service operates from Oct. 15 to April 15. The contract price is subject to a sliding-scale which comes into force according as the mean monthly average temperature is higher or lower than the mean of the monthly average temperatures recorded between 1924 and 1930 at the Toulon Observatory. The system has given excellent results and the number of clients is rapidly increasing. A specimen of the standard form of contract is given in the paper.

The Company accepts responsibility for leaving the installation in as good a condition at the end of a contract as at the beginning with due allowance for normal wear. In the case of flats, arrangements are often made for the caretaker to look after the installation at a small fee.

PURIFICATION.

C. Delahaye described the results obtained with "Laming" material in an installation which was working at an overload and which suffered through excessive loss of pressure, insufficiency of contact time, and sluggish regeneration *in situ*, with consequent slowness in sulphiding. "Lux" mass could not be employed owing to its high cost, and "Limonite" and other oxides proved unsatisfactory. Recourse was therefore had to "Laming" material, which to-day is but little used; and the conditions conducive to the obtaining of maximum efficiency were established by experiment. The material is obtained by impregnating an intimate mixture of sawdust and shavings (10 tons) and powdered lime (5 tons) with a hot saturated solution of 12 tons of iron sulphate. The moisture content of the mass is approximately 45 p.ct. and the material is of good porosity. For each particular sulphur content, maximum efficiency and smallest back pressure are obtained at a definite moisture content; hence when a purifier is being recharged with partially fouled material the moisture content is adjusted to an appropriate value, optimum moisture contents being 45, 35, and 30 p.ct. for sulphur contents of 0, 25, and 40 p.ct. With due attention to this point, an improvement in the direction of increased contact time was possible since, due to the high porosity thereby secured, five boxes could be worked in series. By proper attention to the moisture content of the mass, good re-vivification *in situ* was obtained, only an occasional re-vivification in air being necessary.

The subject of purification was also dealt with at length by the Committee on Manufacture, tabulated information being presented covering the constructional features and operating conditions of the purifiers of 92 undertakings. This information, which is accompanied by a statistical

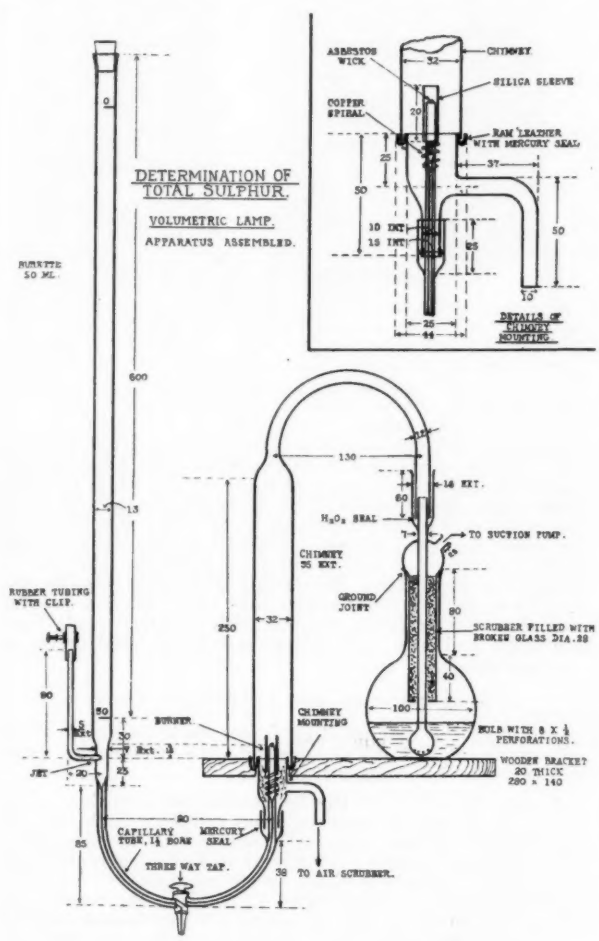
in benzoles, using an early form of the volumetric lamp described below.

The correction for the sulphur contained in the alcohol can usually be made with sufficient accuracy by subtracting four times the percentage by weight of sulphur in the alcohol from the total percentage by weight of sulphur found. A more exact method of correcting for the blank on the alcohol, however, is to correct the sodium carbonate titre, by subtracting the quantity of sodium carbonate solution required when 8 ml. of alcohol are burnt. It is obviously necessary to determine the correction accurately, and for this purpose at least 40 ml. of alcohol should be burnt.

The Volumetric Lamp.

An attempt has been made to overcome some of the disadvantages of the standard S.T.P.T.C. method, and a lamp has been devised that enables any measured volume of the benzole-alcohol solution up to 50 ml. to be burnt. An early attempt to make a lamp of this type was described in the 1926 Report of the Joint Benzole Research Committee, p. 193, but this lamp was inconvenient owing to the attention needed in order to maintain a constant head on the burner, as the level of the liquid in the burette fell.

The lamp in its present form is illustrated in the accompanying figure. The burner consists of a piece of quill



tubing (3-3·5 mm. internal diameter and 25 mm. long) into which fits loosely a roll (20-25 mm. in length) of asbestos tape, which has previously been ignited. Round this burner is fitted a short sleeve of silica tubing (approximately 20 mm. in length), which rests on a copper spiral in order to enable the height of the sleeve to be adjusted for controlling the size of the flame. Although a wick is used in this lamp, errors due to adsorption are negligible on account of its short length, and the fact that the wick is not burnt dry, as is usual with most lamps.

Below the burner is attached a small mercury cup, which normally seals the chimney mounting, to which is cemented the ram leather that serves as a seal for the chimney. When the lamp is in use, the purified air for combustion enters the chimney mounting through the side arm, the body of the mounting being loosely packed with glass wool to prevent air currents which otherwise distort the flame and cause it to smoke.

The burner is connected by means of capillary tubing and a three-way tap to a 50-ml. burette, which is the novel feature of the lamp. The tap is situated at the lowest point of the capillary tube connecting the lamp and the burner, and has an outlet at the bottom for the purpose of draining the burette. Sealed into the side of the burette below the graduations is a jet or air-bleed. During use, the top of the burette is closed with a cork, and, consequently, as the liquid in the burette burns, air can only enter through the jet. This point is thus maintained at atmospheric pressure, and hence the level of liquid in the burner remains constant. Thus, the size of the flame, once set, remains the same throughout the whole determination. Further, since air can only leak *inwards*, the losses due to evaporation during a test are reduced to a minimum, and, moreover, errors due to the evaporation of the benzole-alcohol solution into the air entering the burette can be prevented by attaching to the air-bleed a small scrubber containing some of the benzole-alcohol solution.

Method of Filling and Operating the Lamp.

The solution burnt in the lamp is made up exactly as described in the S.T.P.T.C. method, 20 ml. of the sample being made up to 100 ml. with ethyl alcohol.

In order to fill the lamp, the tap and the air-bleed are closed, and the burette is filled with the solution of the sample in alcohol. The top of the burette is then closed with a well-fitting cork, and the tap is opened to the outlet at the bottom of the lamp, when a small quantity of the solution will flow out of the burette. Finally the tap is turned so that the burner is connected to the burette, and the air-bleed is opened. The solution then flows into the burner to a height governed by the height of the jet. Care should be taken that no air-bubbles are trapped in the tap or underneath the wick. Any bubbles so formed can usually be expelled by moving the wick up and down inside the burner. The lamp is now lit and allowed to burn in the open until air-bubbles are seen to ascend the burette at regular intervals. The chimney is then placed in position and the burette reading immediately taken.

The products of combustion are drawn off through the scrubber, which is exactly as described in the S.T.P.T.C. method. When sufficient of the sample has been burnt, the burette is again read and the chimney immediately removed. The contents of the scrubber are titrated as previously described.

The quantity of sulphur in the sample is: —

$$\frac{0{\cdot}802 \times X}{S \times M} \text{ p.ct. by weight.}$$

Where **X** is the number of millilitres of N/10 sodium carbonate solution required.

S is the specific gravity of the sample at the temperature of the test,* and **M** is the number of millilitres of the benzole-alcohol solution burnt.

Test Results.

As a check on the accuracy of determining the total sulphur in benzoles with the modified apparatus described above, tests have been carried out on solutions made up by weight of different sulphur compounds in pure benzene. This method of checking the accuracy of the results, however, is subject to certain limitations, since in addition to such errors as incompleteness of combustion, there is some doubt as to the exact amount of sulphur present in the solution that is being burnt. Most sulphur compounds are difficult to obtain in a high degree of purity, and it is not easy to weigh out and make up solutions of very volatile liquids, such as carbon disulphide, without appreciable loss. These difficulties, therefore, must be taken into consideration.

Before carrying out tests, all the volumetric ware used was checked, and the sodium carbonate solution was carefully standardized. The wash-flask and scrubber were tested for efficiency, and no evidence was found that the sulphur dioxide was incompletely removed from the products of combustion.

Blank Determinations.

Tests were carried out to determine the sulphur contained in the absolute alcohol and in the A.R. benzene used in making up the solutions. The quantities of alcohol,

* According to the S.T.P.T.C. method, the specific gravity of the sample at 15·5° C./15·5° C. is used. Actually the specific gravity of the benzole, at the temperature at which the solution is made up should be used. An error will only be introduced, however, when this temperature varies considerably from 15·5° C.

outlying districts was a costly matter. But if they used more gas they would in time get the price down.

An Old Company with Modern Methods.

In conclusion, Sir David said that although the Company was more than 120 years old it was very up-to-date in its methods, and he hoped they would find here everything they wished to see. The building was an attractive one, and he thought they would agree that it had been very nicely designed and decorated by their architect, Mr. Walter J. Tapper, A.R.A. Once more he thanked Mr. Cornish for coming there that afternoon.

Mr. Daniel Cornish said that he was very pleased to be there on that occasion and see so many present. It was good of the Gas Light and Coke Company to provide these showrooms in Wickford and to give the residents the opportunity of inspecting them and of meeting the Governor of the Company. In regard to the price of gas, he reminded them that they were only charged for what they used, and the more they used the cheaper it would become. They had the choice of taking their gas through 1d. or 1s. slot meters or quarterly meters. What better service could they want than that? Wickford was very fortunate in having gas, and if they wanted it to come down in price they must make up their minds to use it. They must think of the amount of work involved in producing this gas. It was providing work for the miners, while the Company had a fleet of vessels sailing backwards and forwards night and day between the Thames and the Tyne bringing the coal to the works.

He hoped that these showrooms would be a great success for Wickford—especially because they meant more to Wickford than they did to the Company. He wished the Gas Light and Coke Company very great success.

TOTAL SULPHUR IN : : BENZOLES : :

Determination by the S.T.P.T.C. Lamp Method

By G. Claxton, E. G. Hancock, and W. H. Hoffert, Research Chemists to the National Benzole Company, Ltd.

Introduction.

The standard method of determining the total sulphur in benzoles and other light oil fractions from coal tar is that devised by the late Dr. W. B. Davidson ("Gas Journal," Vol. 185, p. 95) and adopted by the Standardization of Tar Products Tests Committee. In this method, the benzole after dilution with alcohol is burnt in a lamp, which consists of a glass reservoir provided with a special burner consisting of a multi-capillary silica tube. The products of combustion are drawn off by a chimney through a specially designed scrubber containing neutral hydrogen peroxide solution; and the acidity of this solution, after a definite quantity of the sample has been burnt, is determined by titration with standard sodium carbonate solution. The method is fully described with the specification of the apparatus in "Standard Methods for Testing Tar and Its Products" (p. 90).

Some time has now elapsed since the details of the method were published, and as a result of our experiences when using this method for determining the total sulphur in benzoles, the following suggestions are made for improving the apparatus and procedure. Our object in publishing our experiences is to point out certain possible causes of non-agreement between different laboratories, and also to draw attention to a new form of lamp, which we consider possesses certain advantages over the standard lamp. We hope that the suggestions made may be helpful when the revision of the standard method is under consideration. Obviously, it is only as a result of considerable experience that improvements to the technique of a method of this description can be made.

The S.T.P.T.C. Lamp.

In the early sets of apparatus supplied by some manufacturers, the diameter of the reservoir of the lamp was nearly as great as the internal diameter of the chimney. This restricted the air-flow round the lamp and caused the contents to burn with a smoky flame. The internal diameter of the chimney is specified as 32 mm. and the diameter of the lamp as about 30 mm., both with a 20 p.ct. tolerance. This permits the diameter of the lamp to be the same as that of the internal diameter of the chimney. It is suggested that the minimum difference between the diameter of the lamp and the internal diameter of the chimney should be specified as 3 mm.

The silica wicks have given a great deal of trouble. Those first supplied by the manufacturers suffered from the serious defect that when the lamp was lit, small drops of liquid spurted out from the flame, and this continued while the lamp was burning. This source of error was eliminated by making the wicks with somewhat wider capillaries than specified, and as nearly as possible of the same bore. In order to restrict the size of the flame and prevent it smoking when first lit, the length of the wick was increased to 50-55 mm. These alterations in the wick, however, accentuated the difference in the size of the flame when the lamp was full and when the lamp was nearly empty. It was also found that with a given wick the size of the flame was very sensitive to the character of the product under test, and it was evident that for the lamp to burn satisfactorily with benzoles, the wick must be very carefully made to a precise specification. On continued use, the wicks tended to crumble away at the top, and it was necessary to renew them from time to time.

A further disadvantage with this type of lamp lies in the possibility of loss of unburnt vapour escaping between the wick and the hole in the top of the reservoir. The reservoir itself becomes warm during a test. The wick should fit the hole in the reservoir fairly tightly in order to eliminate this source of error as far as possible.

Titration.

Difficulty has been found in determining the end-point and obtaining consistent results when using methyl orange as indicator, even when a few drops of 0·1 p.ct. indigo-carmine had been added, as recommended. The methyl orange added to the freshly prepared hydrogen peroxide solution for the purpose of neutralizing it becomes bleached a permanent yellow colour, which affects the determination of the correct end-point in the final titration. More consistent results were obtained by using instead 6-10 drops of 0·04 p.ct. bromphenol blue solution. This indicator has practically the same end-point as methyl orange and the colour change on titration is from yellow (acid), through greenish yellow and grey, to bluish violet (alkaline). The end-point was determined by matching the colour against a pre-arranged standard, the intermediate grey shade being chosen. In the final titration, the colour of the indicator in the hydrogen peroxide solution was again matched with this standard. The choice of the most suitable indicator is admittedly largely a personal matter.

It is important that the distilled water used for washing down the scrubber be brought to the same end-point as that of the hydrogen peroxide solution. It should be noted that the correct end-point, when titrating a dilute solution of sulphuric acid with sodium carbonate, is on the acid side of true neutrality.

Blank Determination.

No mention is made of a blank determination enabling a correction to be applied for the sulphur contained in the alcohol. Alcohol contains varying amounts of sulphur, and it is very important that a correction should be made. It should be noted that the quantity of alcohol burnt is usually four times that of the sample. Hence the correction for the sulphur contained in the alcohol is approximately four times the percentage by weight of sulphur in the alcohol. Thus, if the alcohol contains only 0·005 p.ct. by weight of sulphur—a figure which we have obtained for absolute alcohol—this amount would increase the apparent sulphur content of a benzole containing 0·20 p.ct. by weight of sulphur to 0·22 p.ct. by weight—*i.e.*, by 10 p.ct. Many samples of alcohol contain more than this amount of sulphur. Therefore, in the absence of a blank correction, it cannot be claimed that the limits of accuracy of the test are ± 0·02 of the true value. The importance of a blank determination on the alcohol is one which we ourselves overlooked when determining the total sulphur

or of benzene and alcohol burnt, were about 40 ml., the results obtained being as follows:—

Absolute alcohol . . 0·004 p.ct. by weight of sulphur
A.R. benzene . . . . 0·015 ,, ,, ,,

Carbon Disulphide.

The results of all the tests carried out on solutions of carbon disulphide in pure benzene are given in Table I.

Table I.

	P.Ct. by Weight of Sulphur as CS_2 Calculated.	Total P.Ct. by Weight of Sulphur Found.	Total P.Ct. by Weight of Sulphur found, Corrected for Blank on Alcohol and Benzene.
1	0·975	0·945	0·915
	0·975	0·960	0·930
	0·975	0·915	0·885
2	0·600	0·600	0·570
	0·600	0·615	0·585
	0·600	0·595	0·565
3	0·590	0·580	0·550
	0·590	0·560	0·530
	0·590	0·550	0·520
	0·590	0·545	0·515

Although the uncorrected results are fairly satisfactory, the results corrected for the sulphur contained in the benzene and alcohol are low. This is almost certainly due to the high volatility of carbon disulphide, which results in losses on exposure to air, subsequent to weighing out the solutions.

The difficulty of preventing loss of carbon disulphide is shown by the results of tests carried out at different times on a solution of carbon disulphide in pure benzene contained in an 8-oz. sample bottle (Table II.). The bottle was tightly corked and was only opened in order to remove sufficient of the solution for the tests.

Table II.

1. P.ct. by weight of sulphur calculated		0·97
2. P.ct. by weight of sulphur found, corrected for blanks on alcohol and benzene.	At start	0·92
	After 13 days	0·89
	After 21 days	0·81
	After 48 days	0·51

When using the volumetric lamp, the only loss of carbon disulphide during the actual sulphur determination is in the air drawn into the burette. The errors thus caused, however, are comparatively small. They can be eliminated, if necessary, by the following procedure. Before filling the burette, a small wash-flask containing some of the benzole-alcohol solution for test is connected to the air-bleed. The inlet tube of this wash-flask should only just touch the surface of the solution. A small quantity of air is then drawn through the wash-flask and into the burette by applying suction at the top of the burette. The tube connecting the wash-flask to the air-bleed and the burette are thus filled with vapour. The burette is then filled and the top immediately closed by the cork. The determination is then carried out as previously described, leaving the wash-flask connected to the air-bleed.

The second of the determinations in Table I. was carried out using this wash-flask in the air-bleed. It will be noted that more satisfactory results were obtained in this way.

A simultaneous determination using the same solution was made by the S.T.P.T.C. method and the comparative results are shown below, both having been corrected for the blank on the alcohol and benzene.

Table III.

P.Ct. by Weight of Sulphur as CS_2 Calculated.	P.Ct. by Weight of Sulphur as CS_2 Found. (S.T.P.T.C. Lamp.)	P.Ct. by Weight of Sulphur as CS_2 Found. (Volumetric Lamp.)
0·600	0·530	0·570
0·600	0·510	0·585
0·600	..	0·565

Thiophen.

The results of all the tests carried out on solutions of thiophen* in pure benzene are given in Table IV.

Again, the uncorrected results are satisfactory, the actual total sulphur found being in some tests slightly higher than the quantity calculated from the percentage by weight of thiophen in the solution. When the results, however, are corrected for the sulphur contained in the alcohol and benzene, the thiophen sulphur in all tests becomes slightly too low.

* The manufacturer's tests on this sample of thiophen showed that it was only 98 p.ct. pure.

Table IV.

	P.Ct. by Weight of Sulphur as C_4H_4S. Calculated.	Total P.Ct. by Weight of Sulphur Found.	Total P.Ct. by Weight of Sulphur found, Corrected for Blanks on Alcohol and Benzene.
1	0·360	0·360	0·330
	0·360	0·365	0·335
	0·360	0·385	0·355
2	0·705	0·680	0·650
	0·705	0·685	0·655
	0·705	0·695	0·665
3	0·970	0·980	0·955
	0·970	0·980	0·950
	0·970	0·990	0·960

Thiophenol and Diethyl Sulphide.

Similar results were obtained with solutions of thiophenol and diethyl sulphide in pure benzene, as shown by the results given in Tables V. and VI.

Table V.

P.Ct. by Weight of Sulphur as C_6H_5SH Calculated.	Total P.Ct. by Weight of Sulphur Found.	Total P.Ct. by Weight of Sulphur found, Corrected for Blanks on Alcohol and Benzene.
0·505	0·515	0·485
0·505	0·525	0·495
0·505	0·495	0·465

Table VI.

P.Ct. by Weight of Sulphur as $(C_2H_5)_2S$ Calculated.	Total P.Ct. by Weight of Sulphur Found.	Total P.Ct. by Weight of Sulphur Found, Corrected for Blanks on Alcohol and Benzene.
0·945	0·900	0·870
0·945	0·890	0·860

Discussion of Results.

Opinions concerning the degree of accuracy obtainable with the S.T.P.T.C. lamp method are conflicting. The divergent views expressed and the discordant results reported appear to be due both to the difficulty of preventing losses of carbon disulphide and to differences of opinion as to the necessity of correcting the results obtained for the sulphur contained in the alcohol. As already stated, no mention is made of a blank test on the alcohol in the S.T.P.T.C. method. In some laboratories this correction appears to be made, while in other laboratories it is assumed that the blank is negligible. In our opinion, it is important that a correction should always be made for the sulphur contained in the alcohol, and sufficient alcohol should be burnt to determine this correction fairly accurately. When this correction is made, the results of tests tend to become low, but it may be pointed out that this is fairly general with practically all lamp methods, and is usually attributed to incompleteness of combustion.

Advantages of the Volumetric Lamp.

Although the manipulation is not quite so simple as in the standard S.T.P.T.C. method, the volumetric lamp possesses the following advantages:

1. Any quantity of the benzole-alcohol solution up to 50 ml. can be burnt, without re-filling the lamp, and hence greater accuracy is secured for samples of low sulphur content. This is of special importance when determining the blank on the alcohol.
2. The lamp can be stopped at will and the results calculated from the quantity of the benzole-alcohol solution burnt. With the S.T.P.T.C. lamp, the last 1 or 2 ml. of the benzole-alcohol solution takes an abnormally long time to burn.
3. Errors due to the solution in the lamp evaporating during the test and escaping combustion are less than in the S.T.P.T.C. method. This is particularly important when dealing with samples containing very volatile sulphur compounds, such as carbon disulphide.
4. The flame can be adjusted to the maximum size that gives smokeless combustion, and it remains constant throughout the determination. Hence the time taken to burn a given quantity of the benzole-alcohol solution (*e.g.*, 10 ml.) is less than with the S.T.P.T.C. lamp.
5. The lamp can be used for a wider range of products, without altering the degree of dilution of the original sample, since the size of the flame is adjustable.

NOTES ON PLANT AND PROCESSES

The "Console" Cabinet Radiator.

John Wright & Co.'s Latest Achievement.

Messrs. John Wright & Co., of Essex Works, Birmingham, have just introduced a new type of gas radiator which is both elegant and efficient. The "Console" cabinet radiator is a beautiful piece of apparatus, and with its high efficiency fresh possibilities are opened up in the heating of interiors.

A new heating principle has been embodied in the "Console," and more comfortable warmth provided. The heating unit is constructed of a series of specially designed refractory bricks arranged over luminous flames. When the radiator is in use the under-surfaces of these bricks attain

The "Console" Cabinet Radiator.

a high temperature and radiate heat downwards on to a reflector, thereby transmitting radiant heat to the room. The refractory bricks are perforated to allow the hot products to enter an inverted trough-shaped container; the products escape through slots in the top of this container into a second similar compartment, and overflow round the bottom edges in the upper container, and this is closed by a cap, except when the radiator is fitted to a flue. The entire heating unit—burner, bricks, and container—is enclosed in a substantially built sheet-metal cabinet with perforated panels of fine mesh pattern at the front and sides. Easy access to the flue nozzle is gained by removing a small section of the back panel. The top of the cabinet is of cast metal.

The "Console" cabinet radiator has been designed to give maximum heating efficiency while eliminating the high temperature convecting surfaces of the old type of loop radiator. The advantages of this new principle are many: A convecting surface of low temperature is proportionately more effective than one of high temperature, odours caused by dust combustion are minimized, and in this new radiator the flow of air relative to the gas consumed is proportioned so that no visible condensation is formed even in the coldest weather. In the "Console" the gas is burned completely, and approximately 25 p.ct. of the heat generated by the combustion of the gas is radiated direct, the remaining 75 p.ct. being emitted in the form of convected heat when the radiator is not attached to a flue. When it is necessary to connect a flue, an open-ended tee should be fitted to the flue nozzle, and under these conditions the total efficiency of the radiator is approximately 75 p.ct. The radiator is governor-controlled and silent in operation; it is readily assembled and quite easily installed.

In a variety of charming finishes—old brass tone, old copper tone, moorland green, and two wood grain finishes (mahogany grain and walnut grain)—the radiator is an excellent appliance for heating either private house or public building, and its simple lines are in keeping with any style of interior decoration, from the florid ornamentation of the Victorian period to the present-day vogue for simplicity in design.

Oil Door Check and Spring.

Many readers will be interested in the introduction of a neat automatic door closer. The latest type of oil door check is built upon new lines. Known as the "Page" automatic door closer, it is a little under 9 in. in depth, and only a fraction over $1\frac{1}{4}$ in. in diameter, and fits closely on the door stile (wood fixing $1\frac{1}{2}$ in. by $2\frac{3}{4}$ in.) while on the door frame there is a narrow plate connected with the main barrel of the door spring by a resilient arm. The finish is chromium plate, and altogether the "Page" is a clean-looking, sturdy, unobtrusive device. It is suitable for light, medium, and heavy doors (up to $2\frac{1}{4}$ in. thickness), and may be supplied right or left-handed.

An attractive list of the "Page" automatic door closers may be had from Messrs. Parker, Winder, & Achurch, Ltd., Broad Street, Birmingham.

REVIEWS

THE SOUTH WALES COAL ANNUAL, 1932.*

This valuable and practical guide to the South Wales coal industry originated in 1903 with the object of bringing foreign coal buyers more closely in touch with the development, working, and transport of Welsh coals, and to provide in a compact and easily accessible form information constantly required by the coal owner, the colliery manager, the exporter and shipper, and the large number of business and professional men whose interests are connected with the Welsh coal trade.

The experience of the past twenty-eight years has amply justified the venture, and the greatly increased circulation is evidence that the Annual has met a want and is fulfilling the objects for which it was initiated.

The subjects covered by the book include steam, bituminous, and anthracite coal, coke and patent fuel, and the work as a whole contains almost every statistical fact of any permanent interest connected with the Welsh coal industry. The following summary of the contents will indicate how indispensable the book will be found by all those interested in matters relating to the South Wales and Monmouthshire coalfield.

Monthly prices in 1931 are given (together with annual prices over a number of years) of the chief classes of steam and bituminous coals; coal freights to chief foreign ports are shown; together with details of coal exports from South Wales and the United Kingdom to each foreign country; also details of production and conveyance and shipment charges. There is an interesting section relating to the prices, production, exports, and manufacturers of coke and patent fuel and the number and description of coke ovens. Wages and marketing schemes receive attention, while pit-wood prices, anthracite output, and costs of production are dealt with. There is a list of collieries in South Wales and Monmouthshire with the names of the owners, pits, managers, and the number of men employed and class of coal worked, followed by analyses of steam, bituminous, and anthracite coals, with the number and descriptions of coal-washing, dry-cleaning, &c., plants.

After a comprehensive review of the coal trade in 1931-32, indicating the competitive position (with statistics) of Germany, Poland, and the United States, follows the text of the Coal Mines Acts of 1930-32, while particulars of the duties imposed by various countries on coal, coke, and patent fuel conclude this very useful book of reference.

* Edited by A. P. Barnett and T. J. Beynon, and published by the Business Statistics Company, Ltd., The Exchange, Cardiff. Price 7s. 6d., postage 6d.

Bath Special Gas Order

Final Proceedings before the House of Lords Committee

The Bath Special Gas Order provides for the transfer of the undertakings of the Chippenham Gas Company and the Corsham Gas Company to the Bath Gas Company, by agreement, and for the further extension of the Bath Gas Company's area by the inclusion of a number of parishes which are not at present within the area of any gas company. The Bath Gas Company also proposed that the basic price system should be applied to their undertaking, which at present is a maximum price company. The Bath Corporation objected to the basic prices at first proposed; but after negotiation between the parties, the following were agreed: Bath inner area, 5·5d. per therm; Bath outer area, 6·2d. per therm; Keynsham, 7·2d. per therm; Colerne, 8·1d. per therm; Chippenham, 10·5d. per therm; and Corsham, 12·25d. per therm. These prices are the existing prices charged in the areas at present supplied. An agreement to give effect to these basic prices was come to between the Company and the Corporation, and thus the Order originally came before the Board of Trade as an unopposed one.

After an inquiry in December last, the Board of Trade decided on principle that it could not agree to multiple basic prices, and insisted that there should be one basic price for the whole of the area covered by the Draft Order, with differential prices as between the Bath inner area and the areas outside. A clause was also inserted to prevent the differential prices charged affecting the consumers' share. As a consequence, a further inquiry was held at the Offices of the Board of Trade in May last to decide what the basic price for the whole area should be, the Corporation and the Company differing on this matter, and at the same time making it clear that they were both willing to abide by the agreement for multiple basic prices if an application to Parliament was successful in reversing the decision of the Board of Trade. Following the second inquiry, the Board of Trade issued its proposed Order, in which the single basic price was fixed at 6·2d. per therm.

The Order as made by the Board of Trade, containing the one basic price for the whole area, was before a Committee of the House of Lords on June 28 and 29. The proceedings on June 28 were reported on pp. 45-46 of last week's "JOURNAL."

The Committee consisted of the Marquis of Bath (Chairman), Lord Redesdale, Lord Ellenborough, Lord Sinclair, and Lord Moyne. The Board of Trade was represented by Mr. F. J. Wrottesley, K.C., the Bath Gas Company by Mr. Tyldesley Jones, K.C., and Mr. Askew, and the Bath Corporation by Mr. Craig Henderson, K.C., and Mr. Villiers Bayley.

Wednesday, June 29.

Mr. TYLDESLEY JONES said that, as the result of the decision of the previous day [which was reported on p. 45 of last week's "JOURNAL"] that the basic prices were to be in accordance with the agreement between the Company and the Bath Corporation, some amendments were necessary. He was glad to say that Mr. Ronca, Director of Gas Administration at the Board of Trade, had met the Company and the Corporation, and the amendments necessary to give effect to the decision of their Lordships had been agreed. There were, however, two points outstanding, and in regard to these Mr. Ronca desired to say something.

Mr. RONCA said that the first of these points related to the clause which provided that the Company should not be authorized to pay more than the basic dividend if they were charging any consumer more than the basic price for gas. The other point related to a clause which provided that gas sold in bulk to another undertaking—of course, at a special price—should not be taken into account for purposes of determining the consumer's benefit under the clause which provided for extra dividend. The second clause was introduced, he thought he was right in saying, in an Order which was given to the Commercial Gas Company in 1926. That was introduced at the Board of Trade's instigation. Both clauses—the one providing that no more than the basic dividend should be paid if more than the basic price was charged, and the bulk supply clause—were introduced in the South Suburban Company's Bill in 1928, when the matter of basic price as a principle was thrashed out before a Joint Committee of both Houses. The Committee upheld the Board of Trade's recommendation on that particular point, although the Board of Trade was turned down on the main issue. Both these protective clauses were put into the Bill, and, accordingly, in the Department they were able to use their best endeavours to get them into future Bills, and they were told that in respect of Orders they were to put them in. Now it was perfectly true that neither of those clauses appeared in the agreed clauses which had been settled as between the Corporation and the Bath Company, clauses which their Lordships directed the previous day should be put into effect. With great respect, he would like to submit to their Lordships that, although these clauses did in a measure bear on basic price and the basic method of control, they were clauses concerning matters which he suggested were not entered into during the previous day's proceedings. These two clauses were protective clauses for consumers, which, he suggested, should be put in in any basic price control.

Mr. TYLDESLEY JONES said the South Suburban case was a very different case from this. In this case the South Suburban basic price clause was considered by the Corporation and the Company when they came to the agreement. There were very grave objections to this as being a most injurious clause to the development of gas supply. The sub-clause read: "No sum shall be (*a*) divided in excess of the basic rate or carried to the reserve fund; and (*b*) applied for the benefit of employees under agreement in respect of any period in which the price charged for gas supplied to any consumer in the Bath inner area at any time during such period is equal to or more than the basic price."

Supposing that they had a consumer in the City of Bath who did not make a reasonable demand upon them and who took just a few therms in a quarter. They had all the plant there available to supply his expected demand. He was the uneconomic consumer they wanted to hit, because he was the person who imposed a burden upon the undertaking, and did not fairly contribute to the upkeep of it. All the rest of the consumers had to pay more because of the uneconomic man. The whole object at which gas undertakers to-day were trying to aim was to devise methods of charge which were going to make these uneconomic people pay a comparatively high price for the few therms they took, when they ought to be taking a large number having regard to the size of the demand they could make upon the undertaking at any moment. If those words were in, it would absolutely destroy that effort which gas undertakers in this country were trying to make. This was why he was objecting to any such words. If any words of that sort were put in, they would have to have a margin, as the South Suburban Company had, of at least 1½d.; but that margin he objected to, because it was still going to put in a limit which would hamper the ability of the gas undertaker to devise those tariffs which, as a matter of fact, the Government Departments were trying to encourage electricity undertakers and gas undertakers to adopt. This was why the Gas Industry to-day was absolutely opposed to this sub-clause, which was called the South Suburban clause, and which to his knowledge had never been put into any Bill except the South Suburban Bill. At the time the promoters did not see any objection to it; but probably there would have to be an effort before very long to get it repealed.

Mr. RONCA remarked that if a clause corresponding to that went in, of course it would have to be drafted in the light of the decision of the Committee the previous day.

Mr. TYLDESLEY JONES then came to his second point—the clause providing that gas sold in bulk to another undertaking should not be taken into account for purposes of determining the consumer's benefit under the clause which provided for extra dividend. He was going to ask their Lordships not to leave that in. Supposing that Bath could induce some adjoining gas undertaker to close down his works and take a supply in bulk from the Bath Company, that inured to the benefit of the Bath Undertaking and the consumers in the Bath Undertaking, because it enabled them to reduce their costs by increasing the make of gas. If they could effect economies which would enable them to sell gas cheaper, it was an advantage for the whole undertaking, and if they could bring down their costs and prices even on such a contract as that, they said it was an advantage which ought to confer some benefit upon the shareholders. If this paragraph was in it meant this—that in arriving at the prices which they had sold at they had to exclude all the gas they had sold under a bulk supply contract. There was only one Act, as far as he knew, where it appeared.

Mr. *Arthur William White*, of Messrs. Cash, Stone, & Co., gave evidence on points that had been raised. He said he was engaged on behalf of the Bath Gas Company, and negotiated with Mr. Arthur Valon the multiple basic prices.

In cross-examination witness said that, so far as he could remember, bulk supplies were not referred to at all in his discussion with Mr. Valon.

After consultation, the Committee decided that the paragraph and the sub-clause which had been discussed should be omitted from the Order.

Corporation Undertakings' Results

Barrow-in-Furness.

At the monthly meeting of the Barrow Town Council on Monday, July 4, Councillor J. Holland, Chairman of the Gas and Water Committee, in moving the adoption of the minutes of the Committee, dealt with the report and accounts of the gas undertaking for the year ended March 31 last. He said he was glad to report a slight increase in the sales of gas of 2,224,000 c.ft., which in view of the conditions prevailing to-day was very satisfactory. In addition, 86 meters and 111 cookers had been connected during the year. With regard to the accounts, there had been an expenditure on capital account of £24,634 in respect of the new plant at Salthouse, and a small sum for new gas services. Turning to the revenue account, on the credit side there were increases in respect of coke of £405 and public lamps of £27. Sale of gas had produced £237 less, tar and liquor £580 less, and private services £41 less. On the expenditure side coal had cost more by £1879; public lamps, £118; management and establishment, £209; loan charges, £566; and renewal contributions, £664. The two last-named increases were, of course, due to increased capital, and the extra cost of coal was due to 1686 tons more having been used. Oil and coke had cost £2287 less than last year, this being due to 28,233,000 c.ft. less carburetted water gas having been made, and reduced fuel consumption consequent on the centralization of the manufacturing plant. Salaries, wages, &c., for manufacture were also down £1846, this again being due to centralization. Repairs were less by £1186, distribution by £63, and income-tax by £498. After setting aside £11,958 for the renewals of works and plant the gross profit for the year amounted to £10,107. Interest and sinking fund contributions were £15,080, bank interest £290, leaving a net loss of £5263 on the year's working, as compared with £7351 the previous year, thus showing a better result of £2088. He would like to remind them that at Dec. 31, 1931, the undertaking was showing a loss of no less than £9679.

Bingley.

A gross profit of £8446, and a net profit of £3362 after meeting capital charges, interest, and instalments on loan and on recently installed new plant, are working results of the Bingley Urban District Council Gas Department for the year ended March 31 last, and the figures constitute a record in the history of the undertaking.

Birmingham.

Birmingham Gas Committee, in their annual trading report to the City Council, state that the quantity of gas sold during the year was 13,701,464,700 c.ft., a decrease of 491,902,000 c.ft., equivalent to 3·47 p.ct. The total charges against revenue account amount to £1,899,322, a decrease of £88,327. Of this decrease £49,227 relates to the cost of coal and gas oil, a smaller quantity of coal having been carbonized by reason of the decreased demand for gas. The distribution charges were reduced from £372,126 to £313,901. As was the case last year, reduction has taken place in the expenditure on repairs to mains, service pipes, and automatic meters. The net amount received from the sale of gas shows a reduction of £64,274, due to the smaller output. Residual products which have produced a sum of £422,848 are also £49,453 below the figure reported last year. The total credits on revenue account amount to £2,257,181, a reduction of £113,726, and provide a gross profit of £357,859 to be transferred to net revenue account. The contribution to the rates for the year from this account amounted to £25,000. The re-construction of the Woodall-Duckham vertical retorts at Nechells and Windsor Street Works (at a cost of £49,000) would be completed in good time for gas-making next autumn. The repair of No. 14 holder at Windsor Street Gas-Works (at a cost of £27,000) is now proceeding.

Bradford.

The financial statement, as prepared and presented by the City Treasurer, shows that the gross income for the year amounted to £428,240, and the gross expenditure to £351,033, showing a gross profit of £77,207; and after providing for net revenue charges there is a net profit on the year's working of £5680. In comparison with the figures for the preceding year, the gross income is decreased by £18,534, and the gross expenditure by £8251, while the net revenue charges (largely by reason of an increased payment of £2315 for interest) are more by £3553. The net profit of £5680 compares with £19,516 earned during the preceding year. From the net revenue appropriation account, which at the commencement of the year had a credit balance of £108,136, the sum of £10,000 has been appropriated for relief of general rate, and expenditure of a capital nature on lamps, mains, and plant, and at the chemical works amounting to £10,426 has been met. The credit balance in this account is now £93,390. The total sales of gas for the year have been 1,917,834,000 c.ft., as compared with 1,954,298,000 c.ft. in 1931, a decrease of 36,459,000 c.ft., or 1·86 p.ct., of which 12,261,000 c.ft. are accounted for by economies in the quantity of gas used for street lighting. The remaining reduction (24,198,000 c.ft.) is largely attributable to the state of trade in the city and to the exceptionally mild weather during the winter months. The total quantity of gas made was 2,078,082,000 c.ft., as compared with 2,119,647,000 c.ft. during the preceding year; being a decrease of 41,565,000 c.ft., or 1·96 p.ct. The coal gas made was 2,012,653,000 c.ft., or 14,902 c.ft. per ton of coal carbonized, as compared with 14,885 c.ft. per ton last year. Additionally, the Department produced 65,429,000 c.ft. of water gas from the newly installed water gas plant. The unaccounted-for gas has decreased by 0·09 p.ct. to 7·71 p.ct.

Evesham.

The annual report of the Evesham Gas Undertaking shows that the sale of gas was less than last year. The financial statement showed a gross profit of £1632.

Hinckley.

The amount of loans outstanding is £88,686. During the year loans amounting to £4610 have been repaid and capital expenditure of £1368 had been met out of revenue. There is a balance in hand of £2124 in the sinking fund account. Revenue amounted to £47,199. Of this amount £36,927 was for gas, £7771 for coke, £1408 for tar, and £6 for sulphate of ammonia. The gross profit was £11,255. The total expenditure for the year was £46,217, leaving a net profit of £981. The total gas made during the year was 233,771,000 c.ft. The yield per ton of coal was 16,502 c.ft., or 79 therms per ton of coal carbonized. The gas sold was 218,363,800 c.ft., as compared with 215,989,200 c.ft. last year, an increase of 2,374,600 c.ft. There are now 7587 meters fixed, compared with 7261 last year—an increase of 326.

Lytham St. Annes.

The Lytham St. Annes Gas Undertaking made a gross profit in 1931-32 of £19,103 and a net profit (after allowing for interest on loans, sinking fund contribution, &c.) of £1246.

Manchester.

The quantity of gas sold was 7,071,783,000 c.ft., which shows a decrease of 1·72 p.ct. compared with the previous year. The average price realized was 3s. 5·09d. per 1000 c.ft. (equivalent to 9·13d. per therm), as compared with 3s. 5·35d. (9·19d. per therm) for the previous year. The income from coke has increased by £653, and the demand for graded coke for domestic use is still on the increase, 640,000 bags of 1 cwt. each having been sold during the year, as compared with 600,000 bags in 1931. The balance of sinking fund unapplied at the commencement of the year was £66,600, and the amount provided out of revenue for the year £156,502. The total borrowing powers of the Department amount to £6,845,506, in respect of which loan capital has been raised to the extent of £5,925,188. The new waterless gasholder was completed and officially put into commission by Alderman Tom Cook on July 10, 1931. This holder is the first of its type which the Committee has erected, and has a capacity of 5 million c.ft. The amount carried forward to next year's account is £17,675.

Neath.

The Annual Report of Mr. W. Clark Jackson, Engineer and Manager of the Neath Corporation Gas Department, showed that there was an increase in the output of gas by over 6¼ million c.ft., while there was a decrease in the amount of gas unaccounted for by leakage to 1·3 p.ct. The wages for the year amounted to £14,440, and over £2000 was paid to the town in rates; this amounted to 2½d. per 1000 c.ft. of gas. The gross profits of the undertaking amounted to £11,045, as compared with £10,766 the previous year. The sales side of the undertaking had maintained a steady progress, and cookers, heaters, and other gas appliances had sold well throughout the year, the sales of these articles amounting to £5282.

Newtownards.

The accounts of the Newtownards (Co. Down) Gas Department for the year ended March 31 show receipts of £16,196, compared with £16,716 for the previous year, and revenue payments of £15,862 compared with £16,528 for the previous year. The price of gas charged was 5s. 5d. per 1000 c.ft. from April 1 to Sept. 30, and 5s. from Oct. 1 to March 31. A special rate of 4s. 7d. per 1000 c.ft. for gas used for industrial and trade purposes was reduced at the same date to 4s. 2d. The result of the year's trading, after repayment of loans and making allowance for the value of stock, materials, &c., at the beginning of the year was a net profit of £431 compared with £413 for the previous year.

Oldham.

The gross revenue for the year on gas-works account amounts to £317,570, and the gross expenditure to £260,622, the credit balance carried to profit and loss account being £56,948. The annuities during the year amount to £2840 and the interest on loans and stock to £22,684, less income-tax. The net profit on the year's working is £5740. This net profit has been reduced by the contribution to the Borough Fund of £4000, to the sum of £1740. The amount in the reserve fund on March 25, 1931, was £35,336. This has, however, been reduced to the sum of

standing feature of the year's work has been the completion of the contract for the erection of a 2 million c.ft. waterless gasholder, which was carried out under the Unemployment Relief Scheme. The actual work of erecting the steelwork was commenced on March 20, 1931, and the holder was completed, tested, and filled with gas by Jan. 23, 1932. During the year 8 miles 1146 yards of new mains has been laid. The total length of mains in the area of gas supply at March 31 was 290 miles 1688 yards. There is a substantial increase in the total number of consumers, which is now 61,956, as compared with 59,488 last year, an increase of 2468. The financial position of the Department still continues to be in a favourable condition, and this year they are able to transfer to reserve account a sum of £4783, against £751 last year. The total expenditure was £216,953, as against £223,118 last year, and the gross profit transferred to net revenue account this year was £85,008, against £79,510 last year.

Parliamentary Intelligence

[From Our Special Correspondents.]

House of Lords.

Private Bills.

The South Suburban Gas Bill has been returned from the Commons with the amendments agreed to.

The Gas Light and Coke Company Bill and the South Metropolitan Gas Bill have been returned from the Commons with amendments. These amendments have been considered and agreed to. All three Bills are now awaiting the Royal Assent.

The Kilmarnock Gas Provisional Order (No. 2) Bill has been brought from the Commons, and read a first and second time.

Gas Undertakings Bill.

The Bill has been returned from the Commons with amendments. These have been considered and agreed to. The Bill is now awaiting the Royal Assent.

Special Orders.

The Rotherham Gas Order, having been passed by the Special Orders Committee, has been approved by the House.

The following Special Orders have been passed by the Special Orders Committee, and await the affirmative resolution of the House: Oxford and District; Sheffield; Yeovil; Newbury; and Cambridge.

House of Commons.

Private Bills.

The Lords' amendments to the South Suburban Gas Bill have been considered and agreed to.

The Gas Light and Coke Company Bill and the South Metropolitan Gas Bill have been read a first time and passed with the amendments.

The Kilmarnock Gas Provisional Order (No. 2) Bill has been read a third time and passed.

Gas Undertakings Bill.

The Bill as amended in the Standing Committee has been considered on report, read a third time, and passed.

Special Orders.

Special Orders on the application of the Newcastle-under-Lyme Corporation and the Rotherham Corporation have been approved.

The following Special Orders were put down for approval on July 12: Worksop Gas Company; Cambridge University and Town Gaslight Company; Oxford and District Gas Company; Sheffield Gas Company; Yeovil Corporation; Newbury Corporation.

Compressed Gas for Motor Transport.

The Secretary for Mines (Mr. Isaac Foot) in his speech on the Mines Department Estimates in the House of Commons dealt with the use of compressed gas.

Trade Notes.

Messrs. G. & J. Weir, Ltd.

This firm's new Manchester Office address is: 44, Corporation Street, Manchester.

A New Remote-Reading Boiler Water Level Gauge.

We have received from Messrs. Dobbie, McInnes, & Clyde, Ltd., of 57, Bothwell Street, Glasgow, particulars of their new "Teledep" boiler water level gauge, which enables readings of boiler water level to be taken at a convenient point remote from the boiler drum. The "Teledep" remote-reading gauge is placed in the most suitable position for observation, say, on a level with the eye of the fireman, and, as it operates at approximately atmospheric temperature, its working conditions are the best possible and make for long life and maximum efficiency.

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Quotations submitted.

£33,427 by transferring the sum of £3118 to the profit and loss account and adding interest to the amount of £1209 which has accrued to the fund during the year. The quantity of gas manufactured at the different gas stations during the year ended March 31, 1932, was:

	C.Ft.		Therms.
Oldham gas station	389,285,000	..	1,849,104
Higginshaw gas station	376,340,000	..	1,791,378
Hollinwood gas station	895,599,000	..	4,254,095
Hollinwood gas station (water gas plant)	1,608,000	..	7,445
	1,662,832,000	..	7,902,022

The amount of coal used in its production was 97,098 tons. The total number of meters fixed on March 31 last was 63,415, which is an increase of 315 as compared with last year. The number of prepayment meters in use has increased during the year from 34,001 to 35,751. The quantity of gas consumed through this type of meter amounted to 694,311,200 c.ft. compared with 677,050,900 c.ft. last year, and from this type of meter no less than £124,707 has been collected during the twelve months, which is an increase of £6493 over the previous year. 404 meters have been fixed in new premises and others in which gas was not previously used, and 89 meters have been permanently disconnected. The actual number of consumers on March 31 last was 58,093.

Shipley.

The Annual Report of the Engineer and Manager of the Shipley Urban District Council's Gas Department (Mr. H. Burton), which was presented at the last meeting, shows a very successful year's working and was the subject of congratulatory remarks. The gross profit of £21,639 is an increase over the previous year of £3330. After providing for interest on loans and repayment of debt there is a net profit of £1588, as compared with a net loss on the previous year of £3729. Commenting on this satisfactory result, Mr. Robson, the Chairman of the Gas Committee, pointed out that it had been achieved entirely by economies effected in the cost of manufacture of gas. The year under review was the first complete year since the reconstruction of the carbonizing plant, and the reduction in manufacturing costs fully justified the Committee's expenditure on new plant and their Engineer's recommendations. The quantity of gas sold during the year showed a slight reduction due undoubtedly to the state of trade in the district, and also to the fact that, while big business had been done in the sale and fixing of gas appliances, the higher efficiency of these modern appliances often lead to a reduced consumption of gas. Another item of interest was the improvement in the quality of coke now produced, which was reflected in the fact that the whole of the production had been sold locally.

Southport.

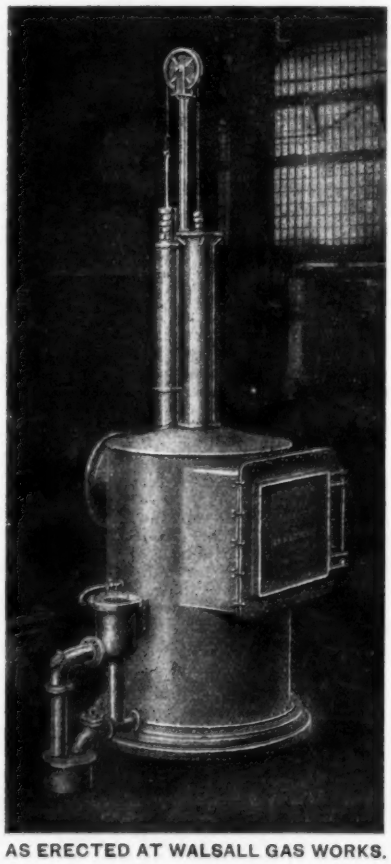
The gas consumed within the Southport area of supply amounted to 797,192,700 c.ft., 76·23 p.ct. of the gas consumed being registered by ordinary meters and 23·77 p.ct. by prepayment meters. When compared with the previous year, there was a reduction of 129 consumers using gas through ordinary meters and an increase of 622 consumers using gas through prepayment meters. The average price received for all gas supplied in the Southport area of supply was 7·77d. per therm net, which is equivalent to 36·54d. per 1000 c.ft. This is 0·22d. per 1000 c.ft. less than last year's figure. The gross profit for the year amounts to £58,853, and after paying interest and sinking fund, income-tax, &c., amounting to £43,978, there remains a net profit of £14,874. Adding this to the balance of £5578 brought forward from the previous year, the total amount at the credit of the appropriation account is £20,453. Of this amount it is proposed to transfer in aid of rates £2475; revenue contribution to capital, new meters, £2925, leaving a balance of £15,054 to be carried forward to next year's account. During the year prices obtained for residual products were: Coke, £19,812, increase over 1931 of £1119; tar, £6179, increase of £836. Concentrated ammonia shows a decrease of £19. The total net increase in residual products income is £1936. The total quantity of gas sold during the year through ordinary meters was 542,095,300 c.ft., prepayment meters 189,482,700 c.ft., public lamps 65,249,000 c.ft., private lamps 32,800 c.ft.—a total of 796,859,800 c.ft., showing a decrease on last year of 2,450,000 c.ft.

Stoke-on-Trent.

The total quantity of gas manufactured was as follows:

	C.Ft.		Percentage of Total
Vertical retort installation	1,205,651,000	..	69·73
Horizontal ,, ,,	299,834,000	..	17·34
Carburetted water gas plant	223,547,000	..	12·93
A total of	1,729,032,000	..	100·00

This is equal to 8,126,450·4 therms, compared with 1,711,255,000 c.ft., equal to 8,042,898·5 therms the previous year, showing an increase of 17,777,000 c.ft., or 83,551·9 therms, equal to 1·04 p.ct. The quantity of coal carbonized was 71,538 tons in vertical retorts and 25,776 tons in horizontal retorts, a total of 97,314 tons, as compared with last year's figure of 74,721 tons in vertical retorts and 25,337 tons in horizontal retorts, a total of 100,058 tons. There has therefore been a reduction of 2744 tons in the quantity of coal used for carbonizing, despite the fact that nearly 18 million c.ft. more gas has been produced this year. The most out-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STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

[For Stock Market Report, see earlier pages.]

Issue	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. July 9 (Provincial Exchanges July 8)	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
1,551,868	Stk.	Apl. 4	7⅞	7⅞	Alliance & Dublin Ord. ...	115—125	+10½	111½—121½
374,000	,,	July 4	4	4	Do. 4 p.c. Deb. ...	78—83*	+8	77
557,655	,,	Mar. 14	7	7	Barnet Ord. 7 p.c.	135—140	...	140—145
300,000	1	Apl. 29	1/4½	1/9½	Bombay, Ltd.	15/—20/-	...	...
177,750	10	Feb. 29	9	9	Bournemouth 5 p.c. ...	17½—18½	+1½	£17 11/-
500,050	10	,,	7	7	Do. B 7 p.c. ...	13½—14½	+½	14
439,160	10	,,	6	6	Do. Pref. 6 p.c. ...	12—13	+½	...
50,000	Stk.	June 20	3	3	Do. 3 p.c. Deb. ...	70—75	+9	...
162,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	90—95	+9	...
210,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	115—120	+11	119—120
357,900	,,	Mar. 14	7½	7½	Brighton, Hove, & Worthing 6 p.c. Con. ...	135—145	+5	140
540,000	,,	,,	6½	6½	Do. 5 p.c. Con. ...	120—130	...	125—128
195,500	,,	,,	6	6	Do. 6 p.c. B Pref.	120—130	...	129½
1,287,500	,,	Feb. 29	5	5	Bristol 5 p.c. max.	106—108a	+4	...
120,420	,,	June 20	4	4	Do. 1st 4 p.c. Deb. ...	85—90a*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	85—90a*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	110—115a	+5	...
855,000	,,	Apl. 4	7	8	British Ord.	125—135	+12½	...
100,000	,,	June 20	7	7	Do. 7 p.c. Pref.	120—130	+10½	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	87—92	+9	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	105—115	+9½	...
160,000	,,	July 4	5	5	Cambridge 5 p.c. Deb. ...	105—115*	+7½	...
100,000	10	May 23	6	6	Cape Town, Ltd.	7¼—8¼	...	7⅞
100,000	10	Apl. 29	4½	4½	Do. 4½ p.c. Pref. ...	6—7	...	6⅞—6⅞
150,000	Stk.	June 20	4½	4½	Do. 4½ p.c. Deb. ...	80—90	+7½	79—84
626,860	,,	Feb. 15	6	6	Cardiff Con. Ord.	100—105	...	...
237,860	,,	July 4	2½	5	Do. 5 p.c. Red. Deb.	105—110*	+6	...
157,150	,,	Feb. 15	5	6½	Chester 5 p.c. Ord.	87—92b	...	...
98,936	1	May 23	2/-	2/-	Colombo, Ltd. Ord.... ...	26/—31/-	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref.	17/—19/-	...	...
609,204	1	Apl. 4	-/10'90	-/11'47	Colonial Gas Assn. Ltd. Ord.	10/—15/-	...	...
296,053	1	,,	1/2'54	1/3'30	Do. „ 8 p.c. Pref.	10/—15/-	...	...
2,073,280	Stk.	Feb. 15	6	5½	Commercial Ord.	100—110	...	102½—109
475,000	,,	June 20	3	3	Do. 3 p.c. Deb. ...	70—75*	...	74—75
807,560	,,	Feb. 15	7	7	Croydon sliding scale ...	132—142	+2	130—139
469,590	,,	,,	5	5	Do. max. div.	90—100	...	92—100
500,000	,,	July 4	5	5	Do. 5 p.c. Deb.	110—115*	+8	112
542,270	,,	Feb. 29	7	10	Derby Con.	117—122e	...	...
55,000	,,	July 4	4	4	Do. 4 p.c. Deb.	65—70c*	...	...
209,000	,,	Mar. 14	5	5	East Hull Ord. 5 p.c. ...	90—100	...	97
179,500	,,	Feb. 29	5½	5½	East Surrey Ord. 5 p.c. ...	105—115	+14½	...
155,019	,,	June 20	5	5	Do. 5 p.c. Deb. ...	110—115	+10	...
1,002,180	,,	Mar. 14	11	10½	European, Ltd.	90—100	+5	95—100
19,405,992	,,	Feb. 15	5½	5½	Gas Light & Coke 4 p.c. Ord.	22/—24/-f	—/6	22/6—25/-
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.... ...	75—80	+5	72½—79½
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	85—95	...	90—95
6,102,497	,,	June 20	3	3	Do. 3 p.c. Con. Deb. ...	73—78	+1	74—77
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114*	...	109¾—113½
2,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	103—108*	...	104—105½
264,011	,,	—	—	—	Harrogate New Cons. ...	100—105	+3	...
82,500	,,	Mar. 14	7	7	Hastings & St. L. 5 p.c. Conv.	110—115	+7	...
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	90—95	+8	90½
70,000	10	June 6	15	†10	Hongkong & China, Ltd. ...	10—11	...	...
213,200	Stk.	Feb. 29	6	6	Hornsey Con. 3½ p.c. ...	105—110	+7½	...
5,600,000	,,	June 6	15	14	Imperial Continental Cap.	180—200	...	175—199
223,130	,,	Feb. 1	3½	3½	Do. 3½ p.c. Red. Deb.	77—82	...	80—81
235,242	,,	Mar. 14	8½	8½	Lea Bridge 5 p.c. Ord. ...	145—155	+13½	155
2,145,907	,,	Feb. 29	6	6	Liverpool 5 p.c. Ord. ...	105½—106½b	+½	...
245,500	,,	June 20	5	5	Do. 5 p.c. Red. Pref. ...	95—100b*	...	...
306,083	,,	Jan. 15	4	4	Do. 4 p.c. Deb. ...	85—90b	...	...
165,736	,,	Feb. 15	8	10	Maidstone 5 p.c. Cap. ...	130—135	...	...
56,176	,,	June 20	3	3	Do. 3 p.c. Deb. ...	65—70	+7	...
75,000	5	June 20	†10	†10	Malta & Mediterranean ...	7½—8½	+1	8—8⅛
892,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	80—85	...	...
171,978	Stk.	Feb. 29	5	5	M. S. D. Utility "C." Cons.	76—81	...	...
718,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	77—82	...	...
112,126	,,	July 4	4	4	Do. 4 p.c. Deb. ...	82—87*	+4	...
148,955	,,	,,	5	5	Do. 5 p.c. Deb. ...	105—110*	+5	...
675,000	,,	21 May '31	16	16	Montevideo, Ltd.	40—60	—10	...
2,061,315	,,	Feb. 29	5	5½	Newcastle & Gateshead Con.	21/—22/-d/	+2/-	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	84—86d	+5	...
691,705	,,	June 20	3½	3½	Do. 3½ p.c. Deb. ...	79—81d	+6½	...
277,285	,,	Apl. 29	5	5	Do. 5 p.c. Deb. '43...	105—110d	+7½	...
199,940	,,	Mar. 14	7½	7½	North Middlesex 6 p.c. Con.	130—140	+14½	...
396,160	,,	Feb. 15	5	5	Northampton 5 p.c. max. ...	90—100	+11	...
300,000	,,	Apl. 18	9	7	Oriental, Ltd.	85—95	...	...
205,162	,,	June 23	8	8	Plym'th & Stonehouse 5 p.c.	135—145	+11½	142—143
504,416	,,	Feb. 15	8	8	Portsm'th Con. 8tk. 4 p.c. Std.	135—145	+11½	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	90—95	+12	...
114,000	,,	Feb. 15	5	5	Preston 5 p.c. Pref. ...	102—107	+8	...
686,312	,,	Jan. 18	4	4	Primitiva 4 p.c. Rd. Db. 1911	77—82	...	...
382,818	,,	June 20	4	4	Do. 4 p.c. Cons. Deb.	76—81*	...	...
150,000	10	Apl. 4	6	6	San Paulo 6 p.c. Pref. ...	7—7½	...	...
1,786,968	Stk.	Apl. 4	6	6	Sheffield Cons.	103—105e	+1	...
95,000	,,	Jan. 18	4	4	Do. 4 p.c. Deb.	82—85e*	...	...
133,201	,,	Feb. 29	8½	5	Shrewsbury 5 p.c. Ord. ...	110—115	+9	...
90,000	10	June 6	15	15	South African	4—6	+1	...
6,709,895	Stk.	Feb. 15	5	7	South Met. Ord.	113—118	+3	112—118
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	122—132	+4½	125—130
1,895,445	,,	July 4	3	3	Do. 3 p.c. Deb. ...	73—78*	+1	74—77
1,000,000	,,	Jan. 18	4	5	Do. 5 p.c. Red. Deb.	107—112	+2	110
91,500	,,	Feb. 29	8½	8½	South Shields Con.	129—131d	...	...
1,543,795	,,	Feb. 15	6½	6	South Suburban Ord. 5 p.c.	110—120	...	112—117
300,000	,,	,,	5	5	Do. 5 p.c. Pref.	108—113	+11	106—112
668,887	,,	June 20	5	5	Do. 5 p.c. Deb.	107—112	+4	115—119
647,740	,,	Feb. 29	5	5	Southampt'n Ord. 5 p.c. max.	90—95	+10	...
121,275	,,	June 20	4	4	Do. 4 p.c. Deb.	90—95	+12	...
250,000	,,	Feb. 29	7	7	Swansea 7 p.c. Red. Pref. ...	...	...	107½
200,000	,,	June 20	6½	6½	Do. 6½ p.c. Red. Deb.	103—108*	...	108
1,076,490	,,	Feb. 29	6½	6½	Tottenham and District Ord.	122—132	+2	120—126
300,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	113—118	+8	114—118
199,005	,,	June 20	4	4	Do. 4 p.c. Deb. ...	90—95	+11	...
85,701	,,	Apl. 4	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	70—75	...	...
346,069	,,	Feb. 29	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	120—130	+7½	...
88,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	100—105	+3	...
1,322,220	,,	July 4	7	7	Wandsworth and District: Consolidated	130—140*	...	132—138
971,373	,,	,,	5	5	Do. 5 p.c. Pref.	108—113*	+10	116—119
1,167,964	,,	June 20	5	5	Do. 5 p.c. Deb.	110—120*	...	...
158,400	,,	Feb. 29	5	6g	Winchester W.& G. 5p.c. Con.	90—95	+5	...

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g* Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

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GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The past week was undoubtedly the most eventful one in financial circles since the end of the war. The close brought with it the news that agreement had been reached at Lausanne on the Reparations question. This, coinciding as it does with the launching of the 5 p.ct. War Loan Conversion scheme, must inevitably play a part in the ultimate success of the latter, and at the same time pave the way to an all-round recovery of confidence and revival of industry. The Stock Exchange throughout the week was the centre of almost feverish activity; all classes of investment securities being eagerly absorbed, especially those of the fixed-interest variety and the stocks of those companies which have been able to maintain their dividends for the past few years. Prices, therefore, in many cases went to higher levels each day as the week progressed.

As an outcome of the foregoing events the demand for Gas Stocks and Shares was greater than ever, and a glance at the Stock and Share List will reveal the effect on prices. It is unnecessary to pick out any particular issue for special mention, as practically all have shown very considerable advance during the past fortnight. Especially is this the case with ordinary and preference stocks, many of which have appreciated on an average from between 10 to 20 points, while a few have exceeded this figure. Gas Light units, though showing a fall of 6d. on the week, were heavily supported as also was the South Metropolitan ordinary, which changed hands at 118, and business in Commercial was done at 109 against last year's highest price of 97½.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *July* 11.

There is very little change to report in the prices of tar products. To-day's prices are:

Pitch, 95s. per ton f.o.b.

Creosote, 3½d. to 5d. per gallon f.o.b., according to specification.

Refined tar is 4d. to 4¼d. per gallon in bulk at makers' works.

Pure toluole is about 2s. 6d.; pure benzole, about 1s. 8d.; 95/160 solvent naphtha, 1s. 4½d. to 1s. 5d.; and pyridine bases, 3s. 9d. to 4s.—all per gallon naked at makers' works.

Tar and Tar Products in the Provinces.

July 11.

The average prices of gas-works products during the week were: Gas-works tar, 34s. 6d. to 39s. 6d. Pitch—East Coast, 85s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 85s. f.o.b.* Toluole, naked, North, 1s. 9d. to 1s. 10d. Coal-tar crude naphtha, in bulk, North, 5d. to 5¼d. Solvent naphtha, naked, North, 1s. 2½d. to 1s. 3d. Heavy naphtha, North, 10½d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2½d. to 3d.; low gravity, 1¼d., Scotland, 2½d. to 3d. Heavy oils, in bulk, North, 4¾d. to 5¼d. Carbolic acid, 60's, 1s. 7d. to 1s. 8d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *July* 9.

Business in this district is quiet, and no change is expected until after the Glasgow Fair Holidays, which commence on Friday next and continue for 7 to 10 days.

Crude gas-works tar.—Actual value is 57s. 6d. to 62s. 6d. per ton *ex* works.

Pitch.—Only small quantities are being made to serve the home market at 90s. to 95s. per ton *ex* works in bulk. Export price is nominal at 85s. to 90s. per ton f.o.b. Glasgow.

Refined tar to Ministry of Transport Specification remains quiet for the time of the year, and quotations are round 4½d. per gallon *ex* works naked.

Creosote oil.—This is a steady market with demand quite constant. B.E.S.A. Specification is 3½d. to 3¾d. per gallon; low gravity, 3¾d. to 4d. per gallon; and neutral oil, 3¾d. to 4d. per gallon—all f.o.r. in bulk.

Cresylic acid.—Very few orders are being placed and prices are weak. Pale, 97/99 p.ct., is 1s. 0½d. to 1s. 1½d. per gallon; dark, 97/99 p.ct., 11½d. to 1s. 0½d. per gallon; and pale, 99/100 p.ct., 1s. 2½d. to 1s. 3½d. per gallon—all f.o.r.

Crude naphtha.—Price continues remarkably steady at 4½d. to 5d. per gallon, according to quality.

Solvent naphtha.—Only a moderate demand exists for 90/160 grade at 1s. 2d. to 1s. 3d. per gallon, while 90/190 grade is almost unsaleable at 11d. to 1s. per gallon.

Motor benzole.—Value is unchanged at 1s. 2½d. to 1s. 3½d. per gallon in bulk quantities *ex* works.

Pyridines.—90/160 grade is 3s. to 3s. 3d. per gallon, and 90/140 grade 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	7	to	0	7½	per gallon at works
Motor ,, ...	1	2	,,	1	3	,, ,, ,,
Pure ,, ...	1	6	,,	1	7	,, ,, ,,

Contracts Advertised To-Day.

Coal.

The Colwyn Bay Gas Department invite tenders for the supply of coal. [Advert. on p. 106.]

The Newtown and Llanllwchaiarn Urban District Council invite tenders for the supply of gas coal. [Advert. on p. 105.]

The Sutton-in-Ashfield Urban District Council invite tenders for the supply of gas coal. [Advert. on p. 106.]

The Workington Gas Department invite tenders for the supply of coal. [Advert. on p. 106.]

Mantles.

The Sutton-in-Ashfield Urban District Council invite tenders for the supply of gas mantles. [Advert. on p. 106.]

Tubes and Fittings.

The Sutton-in-Ashfield Urban District Council invite tenders for the supply of tubes and fittings. [Advert. on p. 106.]

New Capital Issues.

Hexham Gas Company.—This Company, we understand, are to offer for sale by tender £10,000 of ordinary stock.

Sheffield Gas Company.—This Company announce that tenders were received for the issue of £250,000 of 4½ p.ct. redeemable debenture stock (1966) to a total of £841,150. The average price realized was £98 19s. 5·136d. p.ct., and the lowest price at which allotment has been made was £98 5s. per £100 stock, the highest price being £100 11s. p.ct.

Sheppy Gas Company.—The tenders sent in for the £10,000 of 5 p.ct. perpetual debenture stock, offered on behalf of the Directors of this Company, were opened on July 7. They amounted to a total of £33,400 at prices ranging from £110 per £100 down to the minimum of par, the lowest accepted tender being at £101 11s. per £100. The average price obtained was £103 1s. 10d. p.ct.

Gosport District Gas Company.—This Company, having recently acquired the Bishop's Waltham Undertaking, made a further issue of £5000 of stock, which was submitted to public auction at the Sale Rooms of Messrs. Llewellyn Puttock & Blake, Mr. T. Llewellyn Puttock officiating. There was an excellent attendance and quick biddings, with the result that every lot was disposed of, the 5 p.ct. debenture stock, redeemable in 1943, realizing from £107 10s. to £108 15s., and the 5 p.ct. irredeemable preference stock making £105 to £105 15s., the total amounting to £5353 2s. 6d. There is no doubt that the satisfactory prices realized were due to a great extent to the conversion of War Loan.

South Metropolitan Capital Issue.—The Directors of the South Metropolitan Gas Company annouce that, following the appeal by the Chancellor of the Exchequer, it has been decided to postpone the issue of capital which had been contemplated.

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